

Letters to the editor

Equality that must work both ways

Sir, - There is one argument in the *Esher Report* on Architectural Education (*THES*, September 28) which must be of consuming interest to everyone working in higher education, whether in architecture or not.

The report (paras. 8.26-29) states that growth in intakes in recent years has been almost exclusively in public sector institutions, that the 1981/84 cuts in university funding have adversely affected intakes, and that in consequence at Part 1 (degree) level public sector intakes have grown by 18 per cent since 1980, the universities standing still. "Accordingly, we have concluded that the major burden of the reduction in intakes should be borne by schools in the public sector."

Further, in achieving a lower intake, "institutions which have grown fastest in recent years will merit special scrutiny" and "there would be merit in NAB looking critically at those institutions whose schools of architecture have grown fastest in recent years with a view to effecting a reduction in target intakes in 1985."

There seems to be implied here a doctrine of egalitarianism which I for one have never hitherto encountered. One element in it is that intakes in a given discipline shall be more or less equal between the university and the public sectors. The second is that institutional or sectoral support for a discipline shall be penalised, and a collective decision to accord it a lower

priority shall be rewarded. To a political scientist, this doctrine must be fascinating; but I am damned if I can see any glimmer of logic in it. It could be that public sector institutions have had money to burn, while the universities have been cut; but that is demonstrably not the case.

It could be that the difference in achievement between the two sectors has widened, to the advantage of the universities; but Esher's own statistics refute that argument.

Why then parity between the sectors? The argument cannot rest on history, unless a totally arbitrary date ("the beginning of the decade") is chosen; otherwise there must be a weighting towards the universities. It

cannot rest on the professional or applied orientation of the disciplines; otherwise, on any version of the "binary" thesis, there must be a weighting towards the polytechnics.

In short, no explanation is possible save that the two sectors are deemed equal, and shall have equal numbers. In that case, why does not Esher recommend that they shall also have equal funding per student, rather than the gross disparity in "unit of resource" which persists? That argument applies to any discipline.

Yours etc.
GERRY FOWLER
North East London Polytechnic.

The arts and science divide

Sir, - I heartily agree with Jazzy Friday's letter (*THES*, September 28) about the important role which interdisciplinary studies in science and technology might play (given suitable support) in our educational system. His focus of interest is in higher education, but it has occurred to me that an important opportunity for making some progress in this area is a sixth form level in schools is presented by the recent Department of Education and Science proposal to introduce Advanced Supplementary (AS) levels.

Although the arts/science divide is not now so marked in schools (at least as judged by the pattern of A level choices) as it was in the late 1950s when C. P. Snow gave his lecture *The Two Cultures*, it is still fairly entrenched. I am constantly amazed by the general scientific/technological ignorance of the average 18-year-old humanist student I teach. For instance, almost all of them have heard of Copernicus and Darwin, few have any idea of what they achieved. And most have only the remotest conception of the way in which scientific and technological discoveries have had an impact on our cultural, social, economic, industrial and commercial history. When I have regular contact with science students I was struck by their ignorance of these things too.

One of the important principles behind the AS proposal is that it should provide an opportunity to broaden the educational experience of A level students. This must presumably involve the attempt to endow further the arts/science divide in the pattern of A level studies. From the point of view of many arts students, a major obstacle to this under the present system is that most A level science courses require mathematical and technical skills which they think are beyond them. From the point of view of science students, taking an AS course is likely to deprive them of the opportunity of acquiring the full complement of scientific knowledge and skills necessary for degree courses.

An AS course which offered opportunities to examine episodes in the history of science and technology and their industrial, economic, industrial and more general cultural impact might go some way towards lessening the present divisions. By not requiring the mathematical and technical skills required by present science A levels, fewer arts students would effectively be debarred from continuing with their scientific/technological education (their other studies might benefit too), and science students would expand their appreciation of their own subjects and extend their humanistic education. The two groups of students could be taught together thus dividing social' the tendency for them to divide socially and culturally in the same way.

The construction of such a course would require careful planning and perhaps some retraining for teachers. But if my experience of teaching on cross-disciplinary courses is anything to go by, teachers would find the experience of teaching such a course a stimulating one.

The introduction of AS levels provides an opportunity (though perhaps a small one) to reduce it and reduce its appearance to an individual in school. Yours sincerely,

GRENVILLE WALL,
Head of the school of philosophy and religious studies,
Middlesex Polytechnic.

Sir, - I am in the initial stages of my research into the social and psychological effects of "Computer Addiction". Many fears have been expressed by various academics and educators during the past few years and this investigation has been set up to test their veracity.

I would be very pleased if people, with experience of this modern phenomenon, could write to me with details of its effects. (All information will be treated confidentially).

Yours faithfully,
MARGARET A. SHOTTON,
Department of Human Sciences,
University of Technology,
Loughborough,
Leics. LE11 3TU.

Letters for publication should arrive by Tuesday morning. They should be as short as possible and written on one side of the paper. The editor reserves the right to cut, or amend, them if necessary.

Early beard
Sir, - I was intrigued to read in Don's Diary by Alan Lewis (*THES*, September 28) "Unshowered and unshaven my wife drives me to work as I have missed the train". Perhaps Alan will find Mrs Lewis more attractive if a little earlier in order to make time for the niceties of her toiletries.

Yours faithfully,
DUDLEY PICKARD,
57 Essenden Road,
South Croydon,
Surrey.

Living dead



I have just recently learnt that Jeremy Bentham, the distinguished nineteenth century professor of philosophy at University College, London, was buried shortly after his death and is still wheeled out for faculty meetings and other special events by his successors at his old college, to whom he bequeathed his remains. What a fitting symbol of today's academic hierarchy!

Yet surely it does not go far enough. Now that life expectancy is considerably higher than in Bentham's time, is there any sound reason why the process of mummification should not start before death - indeed, before retirement? If all those occupying senior positions in academe who had not produced an article or revised their lecture notes for the last, say, five years, could be persuaded to follow Bentham's shining example, not only would the job crisis disappear, but the universities would be spared much of the expenses of early retirement and would be providing employment for embalmers and down the country for years ahead.

Yours faithfully,
A. D. KING,
Associate senior research fellow,
Sociology and environmental studies,
Brunel University.

Conference note
Sir, - From the article describing the forthcoming conference of the Society for Research into Higher Education (*THES*, September 14), you omitted two important items of information which your readers may wish to have:

(a) Further details about the conference may be obtained from Mr R. Buxton, Administrator, SRHE, University of Surrey, Guildford, Surrey GU2 5XH, and

(b) The book, *Education for the Professions: Quis Custodiet*, which will be distributed to all SRHE members and to all those attending the conference, is published by SRHE & NFER-Nelson, ISBN 1 85059 001 X, £12.95.

Yours faithfully,
SINCLAIR GOODLAD,
Imperial College,
London.

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PNL students aim for peaceful demo

by Karen Gold

Students at the Polytechnic of North London were planning a large peaceful demonstration today as Mr Patrick Harrington, the National Front student organizer, was expected to attend his first third-year philosophy lecture. Student unions throughout inner London had been informed that a peaceful demonstration would take place, according to a speaker from the National Union of Students, whose executive has contributed £100 to the cost of the polytechnic lecturers' recent court case against Mr Harrington, who was also expected to attend the demonstration.

Lecturers have also asked the students not to breach the High Court injunction by Mr Harrington last term to give him unhindered access to the polytechnic. He re-enrolled for his third year last week.

The lecturers' appeal to students comes after the High Court decided last week that they did not have to identify photographs of students who picked Mr Harrington's entry to the polytechnic last May.

Mr Justice Kennedy refused to uphold the order obtained by Mr Harrington that 13 lecturers should look at pictures taken of the pickets to see if they could identify any breaching Mr Harrington's injunction.

The judge said that to sustain the order to name the students was more likely to provoke tension than harm in the polytechnic, since the

protests had now died down and the order was four months old.

Nevertheless he warned that if there was any more trouble at the polytechnic staff could be brought back to look at the photographs. "Any students tempted to register their intolerance in an illegal way may care to think first about the burden their action may bring upon the members of staff who clearly have their welfare much at heart", he said.

Mr Harrington was refused leave to appeal and costs were theoretically awarded against him, though they will not be implemented without a return to the court. But the judge rejected the bulk of the lecturers' arguments on why they should not look at the photographs. He said that as servants of the polytechnic the information they held about students belonged to it and no confidential relationship between staff and student existed on the lines of the lawyer-client relationship protected in law.

The National Association of Teachers in Further and Higher Education wants to hold discussions with the NUS and the Association of University Teachers on this ruling and to issue advice to members.

Mr Peter Dawson, the NAFHE general secretary, welcomed the judge's ruling. "Nafhe opposes unequivocally the views and activities of the National Front but we do not believe that students should be excluded from courses solely on the grounds of their political views," he said.

Leader, back page

Convent puts college site on market

A "unique opportunity to acquire a historic property" - over 14 acres of superbly-sited land in Edinburgh is about to cause confusion in higher education circles.

The site is advertised as Craiglockhart College of Education but most of the campus is now used by Napier College. Craiglockhart was merged during the 1980s with its sister Roman Catholic college of education in Glasgow, and now housed only a small in-service research and resource centre.

The Scottish Education Department owns only around three-quarters of an acre of the site and the rest is owned by The Society of the Sacred Heart which has precipitated the sale.

Napier has an agreement that it can remain at Craiglockhart until July 1986, but it has said it hopes the SED will buy the buildings for its continued use. Napier currently uses the 300-acre site and has 1,000 students and 100 staff working there.

However, it is by no means certain that the Government will acquire the site. The Society of the Sacred Heart is anxious to secure the best possible price, and although the government owns only a small part of the site, it is bound by rules which were drawn up following the contentious sale of Hamilton College of Education to the lowest bidder.

Craiglockhart must be seen to be openly marketed with expensive advertising, and its estate agents estimate that it would be ideal for residential development, or a hotel and conference centre, a nursing home, or prestige office headquarters.

The college was originally built as a hospital for leprosy patients, and served briefly as a military hospital during the First World War, giving refuge to officers suffering from nervous disorders, and Wilfred Owen.

A tempting solution for the government would be to move the Napier contingent to Leith Nautical College which it currently owns, but that too is uncertain. Officially, the SED is to transfer Leith to Lothian Regional Council. But until the Government announces the review of nautical education, which recommends that half Leith's courses be axed, the region will not decide whether it wants the college.

Napier has privately made it clear it opposes the move to Leith. It is on the wrong side of the city, it argues, and is not large enough.

Members of the council's education committee and staff within the education department are also said to be unhappy about the proposal.



American is to be new Warwick v-c

Dr Clark Brudin, an American, a fellow of Jesus College, Oxford, and currently vice chairman of Oxford's general board of faculties, is to become the new vice-chancellor of Warwick University.

He will succeed Mr Jack Butterworth, the university's first vice-chancellor, who will retire in September next year after 21 years in office during which Warwick has developed to its size of 5,300 students and just over 500 staff, particularly strong in biotechnology, manufacturing engineering, and social sciences.

Dr Brudin, (above) who is 53, was

born in Los Angeles and studied at the California Institute of Technology, and Berkeley, California University, where he was awarded a PhD. He worked in the field of rarefied gas dynamics at Berkeley until he was invited in 1963 to set up a research group in the field at Oxford.

He became a lecturer in engineering and a fellow of Jesus, building up the group's work. He was senior tutor at Jesus from 1974-77, and college estates bursar from 1978. He also coordinated a new honours degree in engineering, economics, and management.

He will be estimating what our trade and industry and diplomatic needs are, not our scholarship needs. This will still remain the preserve of the UGC."

Professor Quirk said the Dutch government was embarking on a similar review of its oriental language provision. Professor E. M. Uhlenbeck, emeritus professor of linguistics at Leyden University, will be seeing both Sir James and Sir Peter Swinnerton-Dyer the chairman of the UGC, today to discuss how the British inquiry will be held.

The resolution, which comes up in congregation, the dons debate on October 23, is sponsored by 13 fellows including Professor Michael Dummett, professor of logic, Professor A. H. Halsey, professor of social and administrative studies, Dr Terry Eagleton of Wadham College, and Dr Andrew Glyn of Corpus Christi College.

They have signed the motion on behalf of the Oxford University Students' Union which has run a long campaign for Oxford to disinvest from South Africa. At present some £50m of trust and endowment is held in investment portfolios by the university.

The resolution is carefully worded, calling on the university to sell securities in South Africa firms "as soon as alternative investments of equal or greater expected yield become available", avoiding the obstacle that trustees have a duty to maximize income.

Mr William Hyde, the university accountant, said this week that motion would make little difference in practice. He said no money was currently invested in stocks and shares on the South African market. But he said making good investments was hard enough as it was without adding extra difficulties.

The union is critical of the report for placing the major emphasis on sports facilities and paying little attention to education, by ignoring the strong tradition of community links and high street provision of adult education within Birmingham.

Nafhe has also pointed out the report makes no mention of the increased funding which all-year-round provision of adult education would entail.

The proposal will now come before Birmingham's education committee for discussion in November.

Though the report has not been made public its contents have caused such an outcry that the whole issue has

now been referred back for further consultations.

Representatives from Nafhe this week met Mr J. M. Crawford, Birmingham's chief education officer, to outline their objections to the plan. They also lobbied a meeting of the city council and presented letters opposing the transfer to all councillors.

Under the terms of the plan responsibility for Birmingham's adult education institutes, along with adult sports provision in schools and recreation centres, would pass from the education service to the recreation department, with the aim of implementing a new 52-week programme of provision throughout the city. Youth and community services would also be transferred.

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Oriental language inquiry

by Ngao Crequer

Sir James Craig, the ambassador to Saudi Arabia, is to undertake a one-man inquiry into Oriental and African language provision in Britain, and associated cultural, legal and economic disciplines.

He will be asked to report on national need and not concern himself with institutional provision. His study is expected to take six months and he will report to the University Grants Committee. It will be funded by the Department of Education and Science.

Sir James lectured in Arabic at Durham University from 1948 to 1955 and then joined the Foreign Office. He has been ambassador since 1979 and is about to retire.

The need for a review of this kind was first put to Lord Carrington, then Foreign Secretary, in 1981, by Professor Randolph Quirk, vice-chancellor of the University of London.

In September 1982, the Foreign Office decided against undertaking the review, on grounds of cost, and Professor Quirk and others have been pressing for it ever since. They argue that it is at least as important as the Atkinson inquiry into the provision of Russian studies in 1980.

Professor Quirk said: "There has been a long debate about the scale of the review, whether Latin American languages should be included and what the terms of reference should be. It said it had to include economics and history."

"Sir James will use his diplomatic skills, knowledge of the Arab world and the Foreign and Commonwealth Office and will also deal with the department of trade and industry and the Confederation of British Industries."

"He will be estimating what our trade and industry and diplomatic needs are, not our scholarship needs. This will still remain the preserve of the UGC."

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Advertising campaign

Some of Britain's top advertising agencies, including Saatchi and Saatchi and J. Walter Thompson, have come to the aid of a threatened higher diploma advertising course.

The course, the higher diploma in graphic design and advertising at Hounslow Borough College, was one of a number recommended to have its approval withdrawn by the National Advisory Body board last week. The board was approving a recommendation by the NAB art and design group which considered rationalizing art and design diploma and degree courses over the summer.

The recommendation now goes to the NAB committee. But committee members are receiving a series of letters from a dozen top advertising agencies protesting at the decision and pointing out that the course has won more prestigious graphic design awards than any other college.

According to Mr John Fairbanks, director of visual communications at Hounslow, the course has won 11 nationwide awards in the last four years.

Major advertising agencies send their staff there, and employment for students leaving is generally 100 per cent, though it has fallen to 92 per cent on two occasions.

It is the only course in London specializing in advertising, and highly competitive to enter, he said. The Saatchi and Saatchi letter to the NAB says that the course should not be closed, while J. Walter Thompson says the Hounslow course is one of the few places where people wanting a career in advertising can get relevant training.

Lecturers' pay

Sir, - I note in the *THES* September 21 that the Association of University Teachers salary negotiations have rejected a management offer of an increase 4.75 per cent. I also note that one reason given was that lecturers in further education had received 5.1 per cent and had therefore reduced the differential between university lecturers and lecturers in polytechnics and other public sector higher education colleges.

It would be unfortunate if, once again, the AUT negotiators should misrepresent the level of polytechnic salaries. The rise in polytechnics and public sector higher education generally was 4.6 per cent. The other 0.5 per

cent consisted of a single £330 payment on the top salary point of the scale of lecturers Grade 1 and there are no lecturers Grade 1 teaching on higher education courses in polytechnics.

Both universities and polytechnics have to compete in the labour market for skilled professional staff whose salaries have increased much more rapidly than have those of lecturers in any sector of higher education. It is comparison with these professionals which will be the convincing argument. Polytechnic and university staff should be making the same case - there is no argument for a differential between them either way.

Yours faithfully,
M.A. PETERS,
Executive Member,
Association of Polytechnic Teachers.

Hongkong
Sir, - The Hongkong treaty has finally been initiated and the consultative process begun. There has been much concern over the preservation of the economic system but little talk of how intellectuals may expect to be treated.

Scientists and doctors will presumably be able to take their talents elsewhere or take their chance in a China that desperately needs their skills. But what of those in the arts and social sciences? Will those with independent opinions on China's intellectual and political history, for example, be allowed to continue with non-

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Finally, he accuses me of a "wrong explanation for the temperature-independence of Pauli spin paramagnetism". In fact, I have only written one sentence giving the sort of highly simplified understanding of Pauli paramagnetism in metals that I consider appropriate in an introductory text. My next sentence, "This is discussed in texts on the solid state", shows that I was not attempting an explanation.

E. R. DOBBS,
Hilred Carlisle Professor of Physics,
Bedford College,
London.

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orthodox critiques? Unable to propagate their ideas in the rest of China, will they be allowed to continue unhindered with their scholarship in Hongkong, and if not, what provision is to be made for them?

While the British Parliament is busy discussing economic guarantees for Hongkong, could it not spare a few moments to consider the welfare of its academic community?

Yours faithfully,
G. B. LEE,
Postgraduate student,
School of Oriental & African Studies,
London University.

Electric shock
Sir, - In your review of my book on "Electricity and Magnetism" (*THES*, August 17), Dr Adkins complained that it contained three errors, although it was "reasonably successful in establishing foundations for electromagnetism". To be damned with faint praise is an occupational hazard for textbook writers, but to be accused of "shocking modern undergraduates" with erroneous equations and false statements deserves a reply.

My modern undergraduates are not shocked when I solve equations to obtain a numerical answer and readily accept that 'e' can be used as an abbreviation for 1.60×10^{-19} coulombs or even 2.303, in an appropriate context. Dr Adkins appears to have confused this necessity for equations between physical quantities to be dimensionally homogeneous with the working out of a particular solution to such equation.

His statement that "the electrostatic field inside a metal, is not zero because

there is no net charge density in a metal" is incorrect, since any excess free carriers would move if there was a field and therefore not be in equilibrium. Is he confusing this with the proof of the inverse square law using hollow conductors? My text shows clearly that there is no field inside an empty, hollow conductor because it would violate the circulation law, which does not allow any charge to accumulate on the inside surface of a hollow conductor.

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London.

DON'S
DIARY

To attract attention to its exhibition, "The age of Vermeer and de Hooch, masterpieces of seventeenth century Dutch genre painting", the Royal Academy organized a trip to the Netherlands for a small group of journalists. I was the academic asked to go along to field the awkward questions.

WEDNESDAY

I turn up at the Royal Academy at the appointed hour to find the approach to the Friends' Room a maze of subterranean. Most of the party is already here and it is soon obvious that the journalists do not know one another, so social and professional antennae are at full stretch. Our hosts dispense glass after glass of wine to get things off to a good start. The journalists are an apparently respectable lot: representatives of leading papers and journals, with only one from *Time Out* adding a note of modish raffishness. She arrives appropriately late, just in time to board the minibus that is to take us to Shermess.

We board the Olav Line ship - an elegant floating gin palace - and are entertained to dinner at the 'captain's table', but not before visiting the darkened bridge to witness our departure. In the gathering twilight the captain mutters instructions to members of the crew who pad about the carpeted floor like ballet dancers between acts. We glide down the channel into the dark. This, I think to myself, is what makes art history worthwhile.

THURSDAY

Scheveningen. We are met at Flushing by our guide from the Netherlands Tourist Board. She is depressingly jolly for this hour of the morning: an early example of the incompatibility of Dutch and English sensibilities?

As we emerge from our couch outside the Great Church in Dordrecht the carillon plays *Drink to Me Only with Thine Eyes* and on entering a Bach prelude blares brilliantly from the organ. Gifts galore and most of the party discover a taste for Dutch gin. Then Rotterdam, Delft and this evening a splendid dinner given by the ministry of cultural affairs at which I find myself next to the director of the Royal Picture Gallery.

FRIDAY

Amsterdam. The major part of the day can be skated over - The Hague, back to Delft, being thoroughly quizzed about seventeenth century Dutch art by *The Times* correspondent over dinner at the American Hotel. I am impressed by the inquisitorial alacrity of my companions. When faced with a museum director expecting questions, they probe cooperatively with a firmness and tact which makes many an academic seminar look amateur. One of our party impresses the natives by requiring regular reverse charge calls to his London office. It is, after all, the only way to keep up with the test match score.

Several of us set off after dinner led by the *Time Out* representative who is determined to experience prostitution in the raw. We squeeze down criss-crossing alleys staring at the doll-like girls bathed in red neon light in their nylon, formica and plastic fantasy worlds.

Then to a bar where 1950s existentialism has never gone out of fashion. A band of London origin perform paradoxically at half past midnight. One of our number happens to know several of them. It is all laughably predictable - but enjoyable.

SATURDAY

We have most of our time to ourselves today. I find the hotel recommended by a knowing friend and try to book a room for Monday night. It is a seventeenth century house on a canal and looks as though nothing has changed in it since before the German occupation. The proprietor, whom I was warned was wary, will not commit himself. He suggests that I telephone on Monday morning.

I book my flight to Tegel. I shall go directly to Berlin. I am to perform there at the first of the conferences associated with the Dutch exhibition, which is being shown there before it comes to London.

More late-night bar haunting. On the way back to our art nouveau fantasy hotel we are stunned by African drummers on the Leidseplein. Couples not knowing each other emerge from the crowd to dance at two in the morning.

SUNDAY

Apeldoorn. The swimming pool at the hotel is one of the best things I find right at the top, so the evening sun pools between the tree tops while we splash about languidly. All this effort to a delightful grilling day examining monuments and museums.

After the swim we feast on salmon and venison while further details of the journalists' pasts emerge. One played Tati's English double in *Playtime*, another wrote scripts for *That Was The Week That Was*, a third has been secretary to a famous expatriate recluse near Florence. Most have written books on reputable art subjects. All are sharp, witty and companionable and their society is a delight. How many senior common-rooms can claim as much of their members?

MONDAY

Amsterdam. I leave the party at Arnhem and feel sorry to be missing the last night of journalistic pleasure. But I make up for it unexpectedly in Amsterdam. I meet a fascinating New York actress in an Indian vegetarian restaurant. We joust through the darkening streets on her heavy Dutch bicycle, me perched on the carrier, gripping her waist as we strain up approaches to bridges and hurdle down the other side. Finally we tumble off, to great applause, outside the café for which we are making. We drink coffee late into the night. This is not an alcoholic culture: at the next table on the pavement two boys share a joint while playing a quiet game of chess. I cannot sleep and experience a *nuit blanche* without the least sense of deprivation. I was given a room at the hotel.

TUESDAY

Berlin. My destination turns out to be rather smart: the guest house of the United States Mission. Other speakers at the conference have been put up at a far from adequate hotel. The allocations appear to be entirely capricious. My age and status do not necessarily warrant provision of a bedroom with a balcony overlooking the extensive grounds, my own study and bathroom with the attentions of a housekeeper and maid. I am not even American. Still, it is pleasant to get the fuzzy end of the lollipop.

The Dutch exhibition looks good, but it is too closely hung. It ought to look far better in the Royal Academy where there should be more space. The quality of the painting is stunning. If I had forgotten my academic purpose in life during the last hectically sybaritic week it is now restored by the sight of a splendid array of Dutch pictures.

Ivan Gaskell

The author lectures in Dutch art history and is a fellow of Wolfson College, Cambridge.

£1m business boost for Surrey

by John O'Leary

Two private companies this week increased their stake in higher education with schemes to aid both teaching and research.

In the larger venture, Grant Metropolitan announced a £1m project to build an innovation development centre on Surrey University's research park. It will be the park's first tenant and is expected to be completed by March.

Grant Metropolitan is already heavily involved in research in new technologies, spending almost £8m last year. The centre will be run by the company's biotechnology subsidiary and is intended to use the expertise of a

multinational commercial operation to develop promising innovations.

Mr Stanley Grinstead, chairman of Grant Metropolitan said at this week's launch: "Our primary objective is to help inventions from British universities, research institutes and other sources of original thinking to become marketable products which will form the basis of new British industries in the field of high technology." He added that too many British innovations were forced overseas through lack of funding or because the inventor was unwilling to concentrate on commercial development of an idea.

The centre will offer 16 offices initially and the occupants will be given access to all departments in the university. A

£10,000 prize is to be awarded to the outstanding applicant each year.

In the second project, Hewlett Packard donated 30 computers worth almost £150,000 to the Cranfield School of Management in a novel package which includes a commitment to replace the machines when the company develops more sophisticated models. New training programmes have been developed to take full advantage of the new studio.

Cranfield and the company have cooperated to produce a series of courses designed to make executives aware of the benefits available from computers. The new studio, opened this week, will be used on existing courses as well as the new range.

Hotel students learn to rough it



WHO SAID HIGHER EDUCATION WAS A WASTE OF TIME? I'VE GOT MY HANDICAP DOWN TO FOUR!

The rest of term will be something of an anti-climax for 30 Blackpool students who are spending the first month of their academic year at Scotland's golfing paradise, the five-star Glenagles Hotel in Perthshire.

There has been a month's delay in repair work to a new site for the hotel and foodcraft studies department of Blackpool and Fylde College of Further and Higher Education, and Glenagles agreed to take on the students for some timely work experience.

The students are in two groups, working in the kitchens and the restaurant. Fifteen other Blackpool students are slumming it by comparison at another golfing haven, Turnberry Hotel in Ayrshire, which has only four stars.

Using unemployment as work experience

by Paul Flather

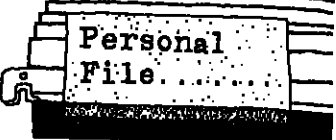
After 33 years' continuous work at the same Lancashire cotton mill, Mr Bert Cooper was made redundant, he then spent 14 months on the dole. "Long enough to knock anybody down," he says. But there was a silver lining: he was then appointed to Nelson and Colne College in Lancashire to prepare a guide on coping with redundancy.

The guide has just been published by Edward Arnold as *The Redundancy File* (price £4.75) compiled by Mr Cooper. He was aided by two graduates who had been unemployed for 15 months since university - Pat Walsh, who read history at Oxford, and David Blackburn, who read politics at Durham.

Mr Cooper, who is now 51, began his working life as a weaver, joining a local family business at the age of 14. Over the years he rose to become a nominee director and general works manager. The firm itself was taken over twice, the second time by a multinational. A few years ago he was one of 420 people made redundant.

With textiles and engineering in steep decline in the area, and his age against him, prospects looked bleak. He says he still got up at 7am each morning, he husbanded his finances very carefully, relied heavily on family support and benefited from a large garden. But depression and all the attendant difficulties did set in.

He spotted the Nelson and Colne post in a job centre and was appointed as supervisor to research, write, and develop a redundancy pack; to give a



summary of redundant workers' rights; and to suggest ways of coping with sudden unemployment. This became an 18-month project backed with a £15,000 Manpower Services Commission grant.

The college prides itself on its strong reputation for retraining, advising, and teaching adults. Mr Cooper sat about his new task eagerly, interviewing 100 local redundant workers, visiting local firms, and carrying out a four-pronged survey of unemployed people in Wrexham, the Liverpool area, north-east Lancashire, and Coventry.

Mr Cooper, who writes poetry in his spare time, landed on his feet again once the guide was finished, heading a new drop-in skills centre being run at the college as another MSC pilot project. Most of his team drew on their own experience, problems from how to invest a lump sum to how to use free time instructively, for example by taking higher education courses.

He is a practical, down-to-earth man and is not at all complacent that once the project finishes he could be back on the dole. He is, however, full of praise for the Nelson and Colne approach. "The staff here are always ready and willing to try any new scheme that will help people in the area face the future."

Walkout over tenure

by Ngaio Crequer

Lecturers at Aston University staged a one hour walkout this week to protest against plans to weaken tenure provisions.

But they had earlier called off a proposed one-day strike in support of technicians after the university withdrew the last two of an original 36 compulsory notices.

By the end of last week all but two of Aston's staff given notice, all technicians, except for one academic-related member, had agreed to accept the terms. One of the two refusals came from Mr Robert Duffy, the branch secretary of the Association of Scientific, Technical and Managerial Staff.

At the last minute the university withdrew its threat to the two technicians. At the same time Mr Peter

Tebbit, the Aston secretary, who has managed the university's contraction programme since the cuts, resigned from his job.

He said he had no job to go to but had only good memories of the university. A change would be in the best interest of his career development.

The technicians' battle is over, but the lecturers' battle continues. They are opposing university plans to streamline and make more effective the "good cause" provisions for dismissal, and to abolish tenure for new staff, by resolution of council, without altering statutes.

The Association of University Teachers was expecting to receive legal opinion this week on the Aston proposal. Council and senate will be discussing the proposal later this term.

Scottish grade gets more recognition

The Scottish universities are poised to extend their recognition of the new secondary school standard grade courses.

Professor E. A. V. Ebsworth, convener of the Scottish Universities Council on Entrance, revealed this when he addressed the annual Head Teachers' Association of Scotland conference in St Andrews.

There has been considerable anger and anxiety in the schools following SUC's announcement in the spring that it would recognize only the first two of seven levels in standard grade English and mathematics, and would not give any recognition to the new examination in science.

Standard grades are intended to be taken in fourth year and will replace the current O grades which are accepted for university entrance. Professor Ebsworth was optimistic that the SUC would extend its recognition to grade three in English and mathematics, and would not close the door on science. If the credit level, intended for top ability pupils, was produced in science, the SUC would give it "very sympathetic consideration".

However, the SUC still sees problems with the new French paper. The new course has no compulsory written paper, reflecting the change in emphasis from written to oral skills.

Careers advice computerized

Computerized careers guidance for graduates and students is to be available wherever it can pay for itself, under a project announced this week by the Department of Education and Science.

The DES has asked computer firms and educational institutions to tender for contracts to design, develop and test a system for computer-aided careers guidance. The National Advisory Body and the University Grants Committee have promised £20,000 each towards development of systems.

Once the testing stage is over, the DES will decide whether to go ahead with a nationally-available system or systems, to be distributed and maintained with money from careers services.

Students should be able to operate the systems themselves, to assess their personal qualities and qualifications, to receive information on jobs and courses and guidance on career decisions. The project has the backing of the Association of Graduate Careers Advisory Services, which last year produced a report on the feasibility of computer-aided careers advice.

Proposals should be with the DES by November 30. A DES official said that the need for the system was based on the number of students who came to higher education without careers in mind and unaware of the swift changes in the labour market.



Here's looking at you, kid: Fred Lyle (left), course tutor on Bradford and Ilkley Community College's art and design degree course keeps an eye on a modelled head by one of his students, Adele Sewell. The head is exhibited in this year's Bradford graduates' degree show, held for four weeks from October 1 at Wiggins Teape Paperpoint, Covent Garden, London.

Britain paid to help China

The British Council has won a share in the world's biggest higher education programme, an international project jointly funded by a World Bank loan of \$5m, intended to increase the annual of graduates in China from a million to six million.

It is the first contract the council has signed with the Chinese government and will bring a minimum of \$3m to Britain. A panel chaired by Dr David Knowlidge, director of the Institute of Educational Technology at the Open University, has already started work in Beijing advising on the external resources needed to fulfil the programme's aims.

The council is servicing the panel, which will spend four months looking at requirements for specialists, overseas training and equipment in polytechnics and television universities. And it will soon sign a contract to send the academics who will provide specialist advice.

A further \$7m contract for organizing overseas training will also be awarded before the end of the year and British firms are involved in a number of tenders for equipment connected with the project.

China is hoping for loans totalling \$1,000m to modernize its educational system. Higher education has been given priority through the emphasis of the current programme on the 29 television universities, 85 study centres, nine transmission stations and 17 polytechnics.

British expertise in distance education was instrumental in winning the contract, although experts from other countries will also be involved.

The council has also signed its second contract with China, to act as consultants for a model library to be built at Beijing's Agricultural University. The project could pave the way for a number of similar contracts.

Planning schools 'must plan their survival' says professor

Planning schools, under increasing pressure as the number of postgraduate awards falls, must diversify and innovate if they are to survive, an international conference of academic planners was told last week.

Planners were meeting at Liverpool University to discuss how to cope with 80 per cent cuts in the number of postgraduate awards from the Economic and Social Research Council from a peak of 326 in 1974/75 to 59 for the coming year. They also marked the twenty-fifth anniversary of the university's civic design department.

They heard how in 1983 there were 10 postgraduate courses recognized by the Royal Town Planning Institute compared with eight, but that the number of students in 1983 was again equivalent to the 1960 number after peaking in the 1970s.

The RPI is to meet Sir Douglas Hogg, the ESRC chairman, next month to discuss public support for planning.

Professor Michael Batt, of the town planning department at the University of Wales Institute of Science and Technology, urged planning

schools to adopt a new attitude and "reinvigorate graduate courses" by greater self-financing and by new types of courses.

Professor Batt, who has just retired after four years on the ESRC's environment and planning committee, said there was no grand plan to save graduate planning education, and he doubted if additional funds would emerge for some time. More overseas students, more specialist one-year MA courses, and more linked loans for students were ideas discussed.

Many schools sprang up between 1930 and 1960 primarily offering two-year courses. New one-year courses are being introduced for example in planning for developing countries by UWIST, in metropolitan planning by Liverpool, and in urban renewal by Strathclyde University.

The conference also endorsed a feeling that the vocational value of the standard two-year postgraduate course needed more publicity, while Professor Andrew Isserman of the University of Iowa appealed for a return to the postwar idealism that characterized the profession 30 years ago.

Action halts nuclear waste disposal project

Industrial action by the National Union of Seamen is threatening part of a research project into the disposal of nuclear waste.

The Natural Environment Research Council's ship, *Discovery*, was due to sail from Portsmouth yesterday to test a deep-sea disposal project known as "penetrators" which are designed to bury themselves 100 feet deep in silt. Electronic sensors would then provide information about the suitability of the

seabed as a site for the disposal of high level nuclear waste.

But the NUS refusal to cooperate with the test, on the grounds that the disposal of high level waste at sea is illegal, led the NERC to cancel the "penetrator" experiment. NERC spokesman Jonathan Lawson said the *Discovery* would now undertake other research not connected with the disposal of radioactive materials.

"I suppose the future of this part of the research must now be in doubt," he

U-turn over training post

by Ngaio Crequer

The vice chancellors' committee has taken what it describes as "a gentle U-turn" and appointed a lecturer to be responsible for the training of university teachers.

The Committee of Vice Chancellors and Principals abandoned a similar scheme in 1981, involving a full-time appointment, under pressure of the cuts.

Now they have appointed Dr George A. Brown, reader in university teaching methods at the University of Nottingham on a part-time basis. His appointment runs for two years from this month and he will have a specific responsibility to encourage the provision of training courses and opportunities at national, regional and local level.

He will be seconded from Nottingham for the equivalent of one day a week and will act as secretary to the

committee for the training of university teachers.

The need to improve the training of university teachers was referred to in the University Grants Committee "strategy" advice, although the CVCP has been planning since the beginning of this year to bring back some kind of scheme.

They have recently carried out two surveys to discover what provision exists in the universities for the training of academic staff. They found that although all universities made some provision, it was usually limited, and had been much reduced over the last few years. Not nearly as many universities as polytechnics had their own full-time staff involved in meeting the provision.

Dr William Taylor, principal of London University and chairman of the CVCP committee on the training of university teachers said the responsibility would still lie with individual

universities but more guidance would be given, and regional cooperation urged.

Dr Brown said that staff development was about teaching, research and administration, all three were important. "Most universities focus on teaching, and even on lecturing, and narrower still, lecturing for new lecturers. I want to widen this, to help people to be better in every role, the young and old, new and established."

He said he saw the department as the unit for staff development and he wanted to help to develop courses for people interested in training, and to develop self-evaluation systems. It was particularly important for people stuck at the top of the lecturers' scale to keep renewing their interest in their teaching and research.

Dr Brown has been at Nottingham for nine years. Before that he was a senior lecturer in social psychology at the New University of Ulster.

White Paper rebellion looms

by Patricia Santinelli

A rebellion against the White Paper *Training for Jobs* may be led by the Manpower Services Commission's educational commissioner at this month's meeting, if it is established that the Government has not in fact issued a directive.

Mr Wilson Longden, the education commissioner, is currently investigating whether the letter sent to all commissioners last month by Mr Tom King, Secretary of State for Employment, was in fact an instruction to implement the White Paper under the 1973 Employment and Training Act.

Last month all commissioners accepted the letter from Mr King as an instruction under the Act to go ahead with the White Paper. This was subse-

quently confirmed by the MSC which decided to start directly negotiating with local authorities rather than the representative associations. But so far the Department of Employment has not confirmed that Mr King's letter was a directive.

"I find out it was not a directive, I will tell the others that we have been misled," Mr Longden said. "As we are an independent body it is also a constitutional issue. I am hoping for the support of the TUC, the local authorities' representatives and the Convention of Scottish Local Authorities."

Mr Longden added that he believed firmly, whether it was a directive or not, that such a change could only be achieved with the cooperation of the local authorities.

The Association of Metropolitan

Authorities is unlikely to change its stance of total opposition to the White Paper.

The Association of County Councils is to review its position on October 19 at a special education meeting. The ACC's current position is that it disapproves of a fundamental change in the control of further education and therefore is not prepared to negotiate on the matter.

But representatives at the meeting will receive a paper putting the MSC position on year one of the White Paper which offers minimum disruption, the redistribution of funds, and 70 per cent funding of certain courses which have commission support. This is fraught with complications because of the different methods used by authorities and the MSC to calculate student numbers.

news in brief

Reading lecturer accepts £30,000

Mr David Hurst, the Reading University law lecturer who was sued for "good cause" (scandalous and vexatious conduct) after alleging that many lecturers were idle and incompetent, has accepted voluntary redundancy and left the university.

He has taken with him £30,000 compensation under an under-50s severance scheme, minus £500 towards university costs. A condition of acceptance was his agreement to drop outstanding proceedings, including a libel action against the university information officer.

Libyan claim

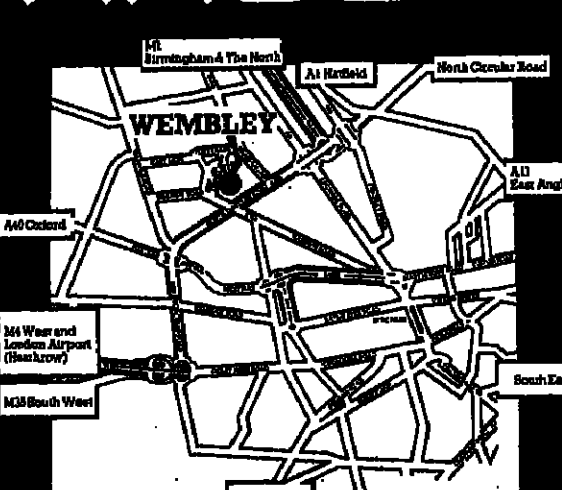
The Libyan news agency JANA has accused the British government of approving a "thoroughly worked out plan" to expel Libyan students from Britain. The alleged plan is said to consist of blowing up a vehicle in "one of London's main streets" and then attributing responsibility to Libyan students, subsequently using it as an excuse for expelling them.

Shelling out

Shell (UK) Ltd has now joined the Department of Education and Science and Boots Charitable Trust in supporting the national "Training the Trainers" programme directed by Professor Maurice Craft, chairman of the school of education at Nottingham University.

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DO YOU KNOW?



On the 23rd to the 25th October 1984 the largest specialised education exhibition of its type in the world will be held at the Wembley Conference Centre.

Daily programmes include Films and Seminars that will keep you in the 'Know'. See and discuss all the latest equipment, news and views with leading manufacturers and educationalists.

Please circulate to all department Heads in the Art, Craft, Design and Technology fields.

Opening address and tour of exhibition by Mr. Kenneth Baker M.P., Minister for Information and Technology at 11.30 am on Tuesday 23rd October.

2 Day Conference on the 24th and 25th October, allowing time to visit the exhibition.

General School Parties NOT admitted; Senior pupils by prior arrangement only.

Design and Technology

D&T

Education and Training

Professor foresees pay differentials

by Ngao Crequer
Universities may soon need to pay differential rates to lecturers to enable recruitment in shortage subjects. Professor John Roberts, vice-chancellor of Southampton University, has told staff.

He told a group of new staff members: "We cannot very much longer avoid the question whether national salary scales, broadly the same across all subjects, are any longer acceptable."

Universities were under increasing pressure to recruit lecturers in certain subjects. "This must eventually be recognized in what we pay if we are not to deprive some subjects of the recruits we need; recruits at all levels, professors as well as new appointments."

He said he did not expect any increase in funding for higher education in the foreseeable future but there was some hope that the proportion allocated to the universities might rise slightly.

In spite of the effective work done by the polytechnics, he said: "I have the feeling that, if there were any more money, this Government would give it to the research outfits of the universities. Even if there is no more money, I do not see things getting worse, if anything because the last round of cuts were so unsatisfactory for the politicians. They didn't get the results they wanted; even more importantly, they didn't get the appearance of the results they wanted."

But Professor Roberts said there

would be more selectivity in funding, which would have implications more far-reaching than many people in universities were willing to accept. More attention would be paid to the performance of university staff and this would radically change the way expectations about career patterns are defined, he added.

There would also be more specialization between teaching and research and more disputes over the value of the contending areas.

"We all know how difficult it is to measure the value or the merit of supporting, say, an arts professor who after eight years produces a monograph on a subject of fairly limited interest, even though his re-

search may revolutionize the study of that subject, and, say, the electrochemist who produces a steady stream of papers which rapidly become the stock in trade of others in their research," he said.

Professor Roberts also said he expected a dramatic change in the type of student at Southampton within the next 10 years. "People here today may find themselves almost exclusively teaching in what we would now call continuing education. Instead of teaching pupils straight from school you will be teaching highly-qualified specialists who come back either for even more specialized training or for conversion, or tapping those pools of potential students who did not come forward at 18."

Knowledge 'industry' predicted

by Maggie Richards

Education would be a major growth sector of a new "knowledge industry" within 25 years, Professor Tom Stonier of Bradford University predicted at a conference in Cambridge at the weekend.

His contribution was one of several urging a broad reappraisal of the whole education system, delivered to delegates at a conference organized by the Cambridge Society around the theme of redefining the boundaries between work, education, leisure and retirement.

Professor Stonier, chairman of Bradford's school of science and society, forecast a further decline in traditional patterns of employment, matched by an upsurge in education and caring professions, with a small, elite band of people working in high technology.

It was essential to double current expenditure on education in order to provide Britain with the sophisticated skills necessary to meet the demands of new technological industries, he argued. Though the numbers employed in such areas would be small, the wealth generated by these enterprises would be sufficient to rejuvenate the economy and boost employment in other sectors.

He forecast a complete overturn of the jobs market in the next 25 years, with only 10 per cent in manufacturing industry while a further 10 per cent would be involved in leisure - another growth area. The new "knowledge industry" would be concerned with the development of information technology and would form the dominant employment sector. Within this sphere education would be the largest single element.

Professor Stonier called for a new pattern of education. Britain's child-oriented primary schooling was "outdated" but its secondary system, with its university-dominated curriculum, was a "disaster". It failed the 80 per cent of students who did not qualify for higher education. A new educational structure which recognized individual talents and was responsive to them was urgently needed.

A similar view of the narrowness of the school system was voiced at the conference by Professor Charles Handy former warden of St George's House, Windsor, and now holder of visiting chair at the London Business School.

The school system concentrated on acquisition of academic skills, but in the world of work there was room for the many other talents people possessed.

Professor Handy also foresaw a change in working patterns, resulting from a shorter working life, with people choosing to divide their lives into "chunks" of employment and leisure. There would be growth in the small business sector, particularly in the area of consultancy work.

But he warned of the dangers of creating a divided society through an employed mercenary class. This would lead to "mutual envy" - with those in jobs resenting having to work to support the unemployed, while those without work would be jealous of the material wealth of those still in work.

Delegates to the conference resolved to pursue debate on the issue.

Strategy body is set up

by Karen Gold

The Inner London Education Authority is to establish a permanent higher education policy section with representatives from across the authority, polytechnic and college directors and staff.

The proposal for a policy body, to be called a strategy section, was agreed by the authority's further and higher education committee. It has still to go to the education committee.

It was first mooted in evidence to the subcommittee's extensive review of Inner London advanced further education last year, and was adopted in the authority's education officer's report. It will draw members from the further and higher education and other subcommittees - including equal opportunities, development, staff and finance - plus two polytechnic directors, one college principal, two teaching staff and one support staff representative.

Its terms of reference are to advise the FHE subcommittee on policy; to carry out periodic reviews; to advise on revenue and capital allocation, and to ensure that the authority is implementing up to date educational and equal opportunities policies.

In fact, its first and highly controversial task will be to cross-examine the capital's five polytechnics on their activities in the past year, and to advise on their funding for next year. Under government proposals to cap the authority's rate-funded spending next year, the LEA would lose £75m, of which £7m would come from the "topping up" which goes to the polytechnics and colleges. The distribution of the cuts would be on a modified form of the positive discrimination formula used by the LEA to distribute part of this year's topping up - with extra money for women, mature, part-time and unqualified students. Responses to the LEA's public consultation document on these cuts are due by the end of this week, after which the authority will decide its budget.

Contest to find peaceful uses

The Greater London Council has launched a competition for London students to encourage them to think about peaceful uses for military technology. Students in engineering, science and technology departments will be asked to put forward new ideas for "conversion" of defence technologies, and the best will get a small grant to develop the work in their departments.

The final products will be judged next autumn, and any with commercial potential will have a chance of help with development and marketing from the Greater London Enterprise Board.

The competition is the brainchild of the Greater London Conversion Council, which was set up to promote transformation of the capital's defence industries. Students entering must work in departments whose work has some defence application. The council expects most of those selected for support will be in engineering, science and technology disciplines, and it hopes the work can be made part of final year projects.

Welsh college supports UN campaign

Some 15 students from all over the world arrive in Cardiff this month to begin a course which represents Britain's main contribution to the United Nations world conservation strategy. The UN campaign was agreed in 1980. By treating the entire world as one biological unit, it encourages growth and industrial progress on condition that the natural ecosystem was maintained, and conservation particularly threatened by new agricultural techniques and increased industrialization, the strategy paid much attention to their needs. Western countries were encouraged to help and last year Britain decided that its priority would be a training scheme in resource land management program for "third world" agricultural workers.

CNAA teaches race harmony

by Patricia Santinelli

All courses for student teachers should be permeated with multicultural and anti-racist ideas, according to a new Council for National Academic Awards document.

The discussion document on multicultural education is being distributed to all institutions this week. It stresses this should cover all practical theoretical elements of the courses, in a move towards ensuring a multicultural and racially harmonious society. This is one of the five aims the CNAA lists in its agenda for multicultural and anti-racist education.

"Any statement of this kind is certain to be controversial. It is hoped however that this paper, which attempts to suggest the aims and objectives of multicultural and anti-racist education in a teacher education context, will provoke further discussion within institutions and their staff," the document says.

An early draft form of the document, which has been prepared by the council's committee for education's working group on multicultural education, is said to have already had a substantial influence in a number of institutions.

The document adds that a multicultural and racially harmonious society could be achieved too by encouraging a critical approach to cultural bias, prejudice, racism and stereotyping in teaching schemes, school and college texts and other teaching materials.

It also wants all prospective teachers to be made sensitive to unintentional racism both in their own expectations and evaluation of and attitudes to students, as well as for example in curriculum materials and student groupings.

The council suggests that teachers should be equipped to recognize that some ethnic minority pupils and students will have particular needs which

should be met through a range of provision, such as education in their mother tongue.

In addition prospective teachers should know what sort of action to take over students who engage in overt racist behaviour.

The CNAA proposes that courses should provide a broad theoretical framework which encompasses the patterns of living, social customs, religions, attitudes and economic conditions of different ethnic and racial groups, the current state of race relations, and legislation and social policies designed to eliminate discrimination in education and employment.

As far as colleges are concerned, the council says that apart from appointing a designated multicultural coordinator - already done in some - they might consider setting up a coordination committee for multicultural and anti-racist education, whose major task might be to devise a policy statement.

Oxford gets a home for dilemmas

by Paul Flather

An institute is to be founded in Oxford to promote high-level academic study of urgent ethical dilemmas, such as *in vitro* fertilization, being generated by modern science and new technology.

The institute, to be based at St Cross College, will set up inter-disciplinary working parties to examine philosophical and theological strands raised by issues such as man's relation to nature, the beginning and ending of life, and the nature of human personality.

No obvious academic home exists as yet to promote in depth study of such issues, brought to the fore partly by rapid advances in modern science and partly by changing attitudes on questions such as abortion, contraception, and euthanasia.

The Ian Ramsey Centre named after the former Bishop of Durham, who was also Nolloth professor of the philosophy of the Christian religion at Oxford University, and was greatly involved in such ethical debates until his death in 1972, will begin work at the start of 1985.

Funds to support the centre, including salaries of a director and some support staff have been secured for five years from the Rhodes Trust, various trusts created by former church colleges of education, and interested individuals.

Dr Arthur Peacocke, currently dean of Clare College, Cambridge, a biochemist and theologian, will be the first director and Ian Ramsey fellow at St Cross. Professor Basil Mitchell, who has just retired at the current holder of the Nolloth chair at Oxford, will head the management committee.

Other committee members include Professor Richard Hare, a moral philosopher, the Rev Professor O. M. T. O'Donovan, regius professor of moral and pastoral theology at Oxford, Professor Sir William Paton, a medical scientist, and two Oxford scientists, Dr Peter Hodgson, and Dr Thomas Tinsley.

Professor Hare, who is also involved with a similar institute, the Centre for Applied Philosophy at the University of Florida, United States, said this week there was a very great need for such an institution to promote serious academic study of new ethical problems.

"There are a number of new ethical problems which have been highly controversial which it is thought have not been studied at sufficiently high academic level. We hope this new institution will do that," he said.

The institute will have a strong contribution from Christian thinkers, but it hopes to develop links with other religions such as Judaism and Islam. It hopes to attract experts and young graduates.

Canada calling

Ten students from Edinburgh University's Centre for Canadian Studies will spend three weeks on Canadian campuses next spring, funded by Northern Telecom, Canada's largest telecommunications company. The company has also given the centre some £34,000 in support of the first British-Canadian direct satellite seminar at the end of this month.



Expecting trumps from the new deal

(Scene one)

Tension around the table. The dealer shuffles and deals. Up pops the familiar face of Sir Keith Joseph. Yet again. No new deal at the Department of Education and Science, but no matter. The National Union of Students forges on valiantly with its campaign "A new deal for students".

A few weeks ago in this column, my colleague Lesley Smith reported on the new radicalism in British student politics. This new mood demands a new form of campaigning for students, and is the essence of our call for a "new deal". For it recognizes the realities of student life in the 1980s: that a good job and corresponding salary no longer awaits every student on graduation, and that questions of independence, standards and choice are more crucial to more students than ever before.

(Scene two)
A hand opens the filing cabinet and extracts a half-forgotten letter. Eyes scan quickly across the page. The pulse quickens as the true meaning unfolds.

"The next Conservative Government will, as we have repeatedly promised, conduct a thorough review of student grants. In that review, highest priority will go to a reduction in the parental contribution and after that changes in the discretionary awards system" (Mrs Margaret Thatcher, August 1978).

Just imagine! Three months into my residency and Maggie herself lends implicit support to the "New Deal" campaign! And not in any confidential leaked memo - a nice change - but in an open and above-board letter to a then Conservative member of the NUS executive.

That "thorough review" is what we've been asking for since she was elected and yet Sir Keith continues to refuse to discuss, let alone implement, such a review. Maybe he hasn't seen the letter.

And what's this - a copy of Hansard...

I have always acknowledged that the new arrangements (for meeting student travel costs) will inevitably involve rough justice... one can do no more than speculate on what effects the new arrangements will have. However, we shall certainly be prepared to consider any hard evidence which emerges on the effects of the new arrangements" (Peter Brooke, July 1984).

The hard evidence is already there. Peter. Our recent survey of undergraduate income and expenditure, backed up by local research at Lancaster University and elsewhere, shows the true extent of so-called "rough justice". That's why the Scottish Education Department abandoned the new arrangements and stuck with the existing scheme.

"One can do no more than speculate" - Indeed! Why go ahead with sweeping changes when insufficient research has been done? And why was it left up to the NUS to undertake costly research to update the picture of student living standards in the 1980s, with the DES happy to base its approach to grants on 10-year-old figures?

The "New Deal" campaign represents a radical new approach for students; its demands are justifiable, and are already receiving widespread support.

Sir Keith, we know you're out there, somewhere. Meet with us, debate with us. You haven't been reshuffled, but it's time your ideas were.

Phil Woolas

The author is national president of the National Union of Students.

Arts centre wins reprieve

Staff at St Andrews University's Crawford Arts Centre hope they have beaten off a closure threat despite losing almost half of an annual grant from the Scottish Arts Council.

The centre, which is funded jointly by the university and the Scottish Arts Council, was threatened with closure when the council proposed withdrawing its £34,800 annual grant from next June. The university could not have taken over the centre completely, since it has already reduced its own contribution since the university grants committee cuts.

However, the centre has now won a partial victory in its appeal against the arts council move. Now the council has agreed to provide reduced annual funding of £20,000 for the centre's exhibitions programme, and that applications for grants for events such as concerts, theatre and children's work "will be considered sympathetically".



"Munch and the Workers" is the title of an exhibition which opens at Newcastle Polytechnic this week, featuring 114 paintings by the Norwegian expressionist painter Edvard Munch. The exhibition was opened by Princess Astrid of

Norway and is on at the polytechnic's art gallery from Monday until November 30. It then goes to Aberdeen, Edinburgh, Belfast, Liverpool and London. This photograph of the artist was taken in 1938 at his winter studio in Ekely.

Fewer Scots school-leavers signing on the dole

by Olga Wojtas
Scottish correspondent

Unemployment among Scottish school-leavers fell this summer by 7,000 over last year, helped by initiatives such as the Youth Training Scheme and the Youth Workers' Scheme.

Mr Allan Stewart, Scottish Office minister for industry and education, announced the figures when he opened a conference on the future of education and training in distribution in Scotland. He said he hoped the country would begin to see a lasting reduction in youth unemployment.

The YTS was much more than a means of getting young people into jobs, it was a major factor in the Government's economic restructuring, he said. Sound vocational education and training made a vital contribution to economic prosperity.

"All of us in this country need to give training a higher priority. In the past, ever more Government spending seemed the answer, but that approach is too remote from the realities of the market-place," Mr Stewart said.

Trainees had to accept that their pay had to take account of the cost of training. This would help keep costs down and encourage employers to invest in it.

The Government could ensure that general and vocational education improved the transition from school to work. Scotland was particularly well served with the 16-18 action plan with its full and part-time modular training programme, he said.

Speaking at the Scottish Conference on Open Learning at Newbattle Abbey College, Mr Stewart added that changes such as the action plan in the Scottish education system were important in changing attitudes to acquiring new skills and knowledge.

People had to be prepared to change jobs, and more than once, while new jobs were more likely to non-manual, requiring more demanding standards of skills.

Last spring, the Manpower Services Commission and education department had launched a scheme to increase training and retraining opportunities for adults, as well as improving collaboration between employers and those providing education and training.

Open learning had a significant part to play in the widening of adult training opportunities, said Mr Stewart. "We have the technology to reach not only those looking for re-training, but also the unemployed, those in retirement and special groups."

Architecture plans attacked

Proposals to cut the number of architecture students and courses have been attacked by Mr John McKenzie, the rector of Liverpool Polytechnic. Mr McKenzie has written to Lord Eshelby who chaired the transitory study group on architecture, to the Department of Education and Science and to the Royal Institute of British Architects.

His letter says that the conclusion of the group, set up 16 months ago by the National Advisory Body and the University Grants Committee, are contradictory and need to be rethought.

The group proposed in its report last week that four architecture schools should close and numbers should be reduced - particularly in the public sector, which have grown faster in recent years.

But Mr McKenzie says in his letter

"If this argument were pursued to the majority of polytechnic courses, there would be virtually nothing left in the polytechnics."

The proposal was also contradicted by the group's support for part-time and continuing education in regional centres, he says, as polytechnic courses tend to provide most of the part-time work. In north west England - one of the three regions, with London and Scotland, singled out by the group for rationalization - only Liverpool and Manchester polytechnics provide substantial continuing education in architecture, he says.

Mr McKenzie has also written to the NAB asking how the recommendations, which were considered but not approved by its board last week, can be implemented in isolation.

Thatcher stars in campaign leaflet

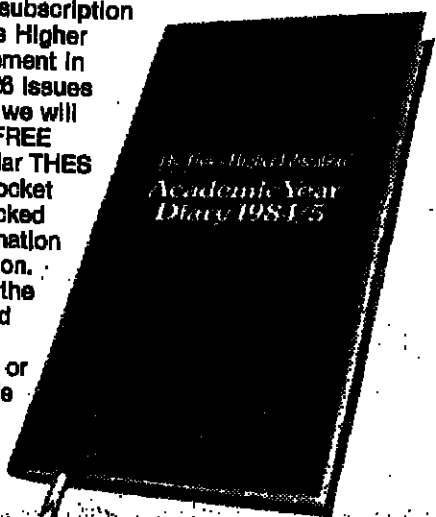
The Educational Centres Association has launched its new campaign for survival on a decidedly light-hearted note. It has brought out a leaflet displaying photographs of Mrs Margaret Thatcher, the Prime Minister and Mr Denis Skinner, her outspoken Labour Party critic.

The leaflet asks what they have in common - and answers that both have agreed to be nominated as vice presidents of the ECA.

But there is nothing frivolous about the message contained inside to all, which is being distributed to all MPs and local education authorities. In a surprise announcement earlier this year the Department of Education and Science decided to withdraw the ECA's £18,000-a-year grant aid by 1988.

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overseas news

Australian concern over advisory body

from Geoff Maslen

MELBOURNE Australian academics are alarmed at what they believe to be threats to the Commonwealth Tertiary Education Commission - the federal government's principal advisory body on higher education matters.

According to the Federation of Australian University Staff Associations, recent moves by the government have cast a shadow of uncertainty over the future of the commission. At an Australian Labour Party conference in July, the minister for education, Senator Susan Ryan, successfully moved to delete from the party's education platform a reference to the "independence" of the commission. This, says the federation, has turned the clock back 25 years or more.

Moreover, Senator Ryan recently announced that the chairman of the commission, Mr Hugh Hudson, had been asked to look at organizational changes in the structure of the commission. The federation, along with other academic unions, is concerned that these moves signal a change of direction which could ultimately lead to the commission being "buried" in the commonwealth department of education bureaucracy, or even lead to a new department of tertiary education.

More than 10 years ago, Australian governments received advice on what was happening in the tertiary sector, and how much money should go to it, from three separate commissions concerned with universities, colleges of advanced education and technical and further education.

Eventually, the three separate bodies became councils, subsumed under a single commission with the chairman of each council having a place on the TEC. In time, too, state governments set up their own tertiary or post-secondary advisory bodies to coordinate advice and information from institutions. This has produced a complicated web in which institutions

send details of their needs and performance to Canberra via the state authority, through the relevant council, to the commission.

The commission has been criticized in the past by academics for not taking its charter of independence more seriously. But with what the federation sees as the government's obvious reluctance to accept the commission's advice this year, the staff unions fear things will get worse.

The general secretary of the federation, Mr Les Wallis, says: "I think the government would not like to be embarrassed by having an independent body pointing out it should be spending so much more."

Mr Wallis for one, believes a policy change by the government could provide the opportunity to get rid of the three councils and turn them into secretariats. This would disturb the direct relationship universities have maintained with the universities council (and its commission predecessor).

"We have our own opinion on the way in which the system actually works, but we don't think the answer is to do away with it," Mr Wallis says. He agrees the councils appear to have become very isolated.

A collective of higher and further education teachers and student groups, called the Higher Education Round Table, has proposed that the commission should be broadened rather than restricted. A submission by the HERT to Senator Ryan argues the commission's role should be to provide independent expert advice to the government, without being hamstrung by political considerations, and to determine the distribution of financial resources - made available by the government - between the three tertiary sectors.

According to HERT, for the commission to achieve its role as an independent expert body, it should be more open and subject to greater public scrutiny than at present.

Polish academic issues open letter on human rights

Polish physicist and human rights activist Zbigniew Romaszewski last week issued an open letter in support of Dr Andrei Sakharov and his wife Elena Bonner, whom he described as "two merited champions of human rights in the USSR".

Romaszewski, a member of the human and civil rights group KOR and a Solidarity activist with a special interest in branches of human and civil rights in Poland, was arrested in May 1982 for helping to organize the clandestine Radio Solidarity under martial law. His trial, with three other KOR and Solidarity activists, on charges of attempting to overthrow socialism in Poland, was interrupted in July by the general amnesty issued in celebration of 40 years of Socialist power in Poland. Under the terms of the amnesty, however, the charges could be renewed if he indulges in further "provocative" actions, such as the issuing of the letter.

Romaszewski addressed his letter to two Paris-based émigré journals, the Polish-language *Kultura* and the Russian-language *Konkurent* and also made it known to Western journalists in Warsaw, hoping that in this way news of it might get through to the Sakharovs.



Sakharov: "merited champion"

He was well aware, he said in the letter, of "how little the law or a sense of ordinary human justice means to totalitarian regimes intent on pursuing their own political ends" but at the same time knew from his own experience that the "constant pressure of world public opinion" can be a deciding factor in the face of those unjustly persecuted by such regimes.

IMF blamed for mass sackings

Seven thousand university and secondary school lecturers and teachers in Chad have been sacked, amounting to 40 per cent of the country's workforce in government employment.

According to Radio France International, this move is believed to be related to a recommendation of the International Monetary Fund which last month granted credit to Zaïre, in return for government cutbacks in spending and to programme to "improve productivity".

Danish survey shows discrimination

From Donald Fields

HELSINKI Danish women are worried that the appreciable shift from humanitarian to technical disciplines is endangering a form of sexual discrimination in higher education. Though they appear exceptionally emancipated by international comparisons and hoary sex-role stereotypes have been widely discarded, many are convinced that the aptitude for handling computers is something innately masculine that they do not share.

After interviewing 113 female students and graduates of high schools of technology and engineering, two sociologists, Anne Bruvik Hansen and Yvonne Due Billing, concluded that their sample regarded itself as a pariah in the educational process.

With a figure of only 12 per cent, engineering attracts the lowest female proportion of students. Other subjects in which girls from less than a third of the intake include political science and journalism. By contrast, over 80 per cent of those engaged in studies oriented to future careers in nursing, child care, pharmacology and business languages are women.

Malaysia to take tough drop-out line

by Geoffrey Parkins

The Malaysian education ministry in Kuala Lumpur is to take a tougher line with students who drop out of teacher training courses, following an alarmingly high drop-out rate and a recent report that the country will soon face a shortage of teachers in key subjects.

The ministry has ordered the Universities Central Unit (UCU) to refuse applicants who have resigned from such courses and has imposed a fine of RM333 on more than 200 trainees who resigned last year.

The deputy director-general of education, Datuk Abdul Rahman Haji Arshad, said: "This move was necessary to discourage new recruits from leaving once they had been selected for teacher training. It is a great waste because vacancies created by resignations cannot be filled since five months of training have already gone by." He advised applicants to make sure they were dedicated to teaching before applying.

The problem has mainly been caused by the fact that teacher training courses commence about five months before university places are offered.

Out of the 6,000 trainees selected by Malaysia's 26 training colleges every year, around 300 (5 per cent) resign from their three-year courses after only five months. The worst figure was in 1981, when 600 (10 per cent) resigned.

The Peninsular Malay Students Federation (PMSF) was fuming over the ministry's decision, which its president, Enckil Ramli Yusoff described as "retrogressive and unfair". Very few students are thought to be able to afford the fine.

The PMSF annual conference in Johore Baru argued that including Malaysia within the fine and university ban was inconsistent with Malaysia's Bumpitara policy of positive racial discrimination for Malays.

New ballot to be held on non-academic union preference

from Lindsay Wright

WELLINGTON A fresh ballot on union membership of university non-academic staff has been announced by New Zealand's new Labour minister of state services Mr Stan Rodgers, following controversy over the results of a ballot held last year.

In March last year the staff, mainly administrative, clerical and computing personnel, were declared to be state servants by the National government and voted in December to join either a small, new group called the Associa-

tion of University Staff or the private sector Clerical Workers' Union.

The AUS won by 934 to 650 votes but subsequent informal ballots on five of the seven campuses showed a three to one preference for the big state union, the Public Service Association, which had not been able to contest the earlier ballot.

The National government, despite strong protest from three campuses, accorded recognition to the AUS, prompting the Labour opposition to promise a fresh ballot when it came to power.

Mr Rodgers wavered for a while

Concerted propaganda has completely failed to raise the female share of technical students. After matriculation, then enrol themselves into further education far more frequently than women, and there are proportionately three times more males than females on "long" courses of university study.

The Hansen-Billing study deplores technology and engineering as almost exclusively male preserves that exclude creativity and fantasy - virtues deemed "primarily feminine".

Given official projections that unemployment in general will hit women more severely than men by the year 2000, that the outlook for the "feminine" social sciences and humanities is especially gloomy, and that girls will continue to "prefer people to objects", critics have detected more than a whiff of discrimination, unintentioned or deliberate.

Their contentions are backed by a survey of comprehensive school pupils approaching puberty age in Aalborg, Denmark's fourth largest town. This shows that after four months of initiation into data-processing, whole classes of the girls but only individual boys found their minds wandering away

from visual display units to the opposite sex. The survey implied that it was little wonder if females, once the embarked on tertiary education, felt alienated from technical courses.

Mr Poul Bache, a senior official at the ministry of education, believes the problem is rooted in childhood. Despite Denmark's enlightened reputation, junior schoolchildren are still led to favour a clearcut dichotomy between "masculine" and "feminine" jobs.

From all this, two questions arise: does technical education intimidate girls? And why are the more females with technical degrees or diplomas than the average Dane? Mr Bache says some employers have devised strategies to circumvent anti-discrimination laws, and that the consciousness of sex roles among teachers and vocational guidance officers inevitably rubs off on juveniles.

Mr Bache views the issue as vital because computers could help determine how Denmark, as a small country, will relate to the work of the future and will be a key factor in its competition with other nations.

Economic problems cause of Mexico's brain drain

from Emil Zubryn

CUERNAVACA

The National University of Mexico (UNAM), in a frank self appraisal, acknowledges that efforts to achieve academic excellence in various fields falls far short of projected goals.

There are also continuing problems such as a high rate of drop-outs, and no workable programme to ensure a better distribution of professors to universities throughout the republic.

Mr Bejar Navarro, a university spokesman, said professors still are poorly paid, and most have "inferior" teaching capabilities. More highly skilled, serious professionals are being wooed away from universities by business at salaries far higher than those Mexican universities, including UNAM, can afford to pay.

There has been much talk of late about the recent academic reform which is designed to spruce up the entire university structure. But Mr Navarro said that national economic and political shortcomings (the present administration) have caused many universities problems which contribute to low academic levels.

The explosive increase in the student body, now around 400,000 at UNAM, is one negative factor. In order to cope with a mushrooming student body, UNAM hired young, virtually inexperienced teachers.

Then there is the perennial problem that for all the allegations of the present regime of president Miguel de la Madrid Hurtado, affects many

would-be students from the ranks of the working and underprivileged classes.

Statistics - not from the government but compiled by private sources - indicate that students coming from the middle and upper classes have the best possibilities of attending and graduating from institutions of higher learning.

The UNAM administration has reported lately that it must be "strict" in its selection due to the very high rate of overcrowding of campus facilities. But a rejection rate in excess of 30 per cent has been criticized by labour leaders, social service groups, and minority parties who have no voice in the Mexican political structure and are permitted to exist to bolster the so-called "democratic" image of the Mexican political system) who feel that funds should be used to give university education to all applicants. Weeding out those who cannot make the grade could be done later where students show they are not capable.

Another problem in Mexico is the over-saturation in some careers, notably medicine, law and some areas of engineering and architecture. Although have been made to correct this situation but it is here that students intensify still lies.

Finally, in a critical charge aimed at students themselves, Professor Alberto Villegas, an ex-director of the faculty of philosophy and letters at UNAM, said that "a great majority" of students show a chronic deficiency: they have not learned to read and write clearly.

Philippines students in fees protest

More than 500 students barricaded the main campus and threatened to paralyse the University of the Philippines, Manila, following the failure of the student council's lawsuit to prevent the university raising its tuition fees by 200 per cent.

Many classes had to be closed but police reported that the protest was peaceful and nobody was hurt.

Loures Almazan, student council chairman and organizer of the protest,

said: "If the administration still refuses to give in, we're going to close the country's premier educational institution. We will paralyse the university." The 200 per cent increase in tuition fees, from about \$20 to \$60 per year is said to be beyond the means of most students.

However, the university's vice chancellor, Luis Beltran, said that with rising costs and inadequate government subsidies the increase in tuition fees had become unavoidable.

has decided to return marked examination scripts to 19 candidates who asked for them back under the Official Information Act. It is now too late for other candidates to apply for their scripts - existing rules provide for all scripts to be destroyed by May 31 and the board had retained the scripts for the 19 candidates pending the outcome of their appeal to the Ombudsman.

Returning large numbers of scripts would be both costly and time-consuming. The education department has set up a temporary office to deal with several thousand requests.

Importance of leadership highlighted

from Deborah Kasoff

WASHINGTON Following three years of study and over 800 interviews with higher education experts from across the United States, the Kerr Commission on strengthening presidential leadership has concluded that the American college and university presidency is in trouble.

"The job of the president is a critical one in a college or university and used to be the most sought-after position in the institution. Our evidence shows that it is no longer true," said Dr Clark Kerr, president emeritus of the University of California and director of the commission. "From these interviews, it became clear that higher education institutions are facing a growing problem of leadership."

The commission report, released this week, states that many college and university search committees are currently experiencing severe problems in attracting interested, qualified applicants. In addition, the turnover rate has increased dramatically.

The first and most important step governing boards can take to counteract the problem is to review the character of the presidency and make changes which would increase both the effectiveness and the potential attractiveness of the position to qualified

persons, according to the report.

To increase the attractiveness of the position, the report recommends making the president a full board colleague with equal status, providing an adequate and competent staff, avoiding placing the president in direct confrontation with faculty unions, and relating the president to academic affairs.

The role of the president's spouse. The commission urges that boards seek agreement on and understanding of the role the spouse is expected to play, that the chosen role is understood in advance and that adequate staff and financial support is provided for whatever active role is chosen.

"Many presidents today see themselves as drawn outside academic life by the demands of their external roles of fund raising and public relations, and pushed out by faculty assertion of control over academic affairs," the report states. "The president should be the chief academic officer in fact, and the president has a special obligation to innovate and initiate academic policy."

Governing boards themselves should provide the president with support and create an effective environment for presidential leadership. According to one president the board interviewed, "the job of president is 25

to 30 per cent more demanding than it should be because of extramural interference from the board of trustees. Too much has to be approved by them."

The report recommends that boards clearly define the line that divides the president's responsibilities from the board's, encourage faculty support for the president and provide more advice and consent than direct action in the areas of management.

It says the search process employed by governing boards can make a fundamental difference in attracting qualified candidates and the commission takes particular exception to the public disclosure of individual names under consideration.

The commission urges governing boards to protect the confidentiality of candidates while the search process is underway and in cases where public disclosure is necessary because of state laws forbidding closed meetings, the commission urges both higher education and public officials to work to eliminate such "sunshine" laws.

The objection to "sunshine" law is based on findings that many persons refuse to be considered for the position if their candidacy is made public because of the possibility of embarrassment or strained relations with their current employers.

All Transkei students expelled

from Carolyn Dempster

JOHANNESBURG

In an unprecedented move, the entire full-time student body at the University of Transkei (Unutra) was expelled this week for "intransigence" in refusing to end a lecture boycott.

The decision to expel the 2,000-odd students was taken by Transkei's minister of education, Mr H. H. Bulu last week but Unutra vice chancellor, Professor B. de V. Van der Merwe said he knew nothing of the decision.

In a public announcement in Umtata, Mr Bulu said the students were being expelled for their "intransigent attitude" towards the authorities' attempts to persuade them to return to classes.

All would have to reapply for admission to the university next year if they wished to resume their studies. He said he hoped the expulsion would end the unrest which has plagued the home-land campus.

Professor Van der Merwe said as far as the university council was concerned, a decision had already been taken to keep the campus open until November 30.

The fate of the 248 male students arrested by Transkei police in a dawn raid on the campus last month - the reason for the extended lecture boycott - remains undecided. The case was postponed for the second time this week to October 23, and all of the students have been released on bail.

This year has seen violent clashes between Transkei police and students, the deportation of eight lecturers - five of them professors - and the intervention of Transkei security police in university administration.

University authorities have been warned to "discipline or eliminate" from their campuses those people who disrupt academic activities for "ulterior political motives".

The warning was issued by the new minister of cooperation, development and education, Dr Gerrit Viljoen this week in the wake of student disturbances which have severely disrupted the academic year at a number of South African universities. He said many elements were undermining the effectiveness of one of the most expensive of public services.

The time had come when a responsible government and thousands of taxpayers should ask themselves whether investments in higher level manpower and facilities in institutions "if they fail to take serious and effective steps to discipline those of their members who undermine the very reason and cause of their existence".



Soccer scholars score again

from John Walshe

DUBLIN

A soccer scholarship scheme introduced in 1979 is paying handsome dividends for University College, Dublin (UCD). Last May it became the first university in Western Europe to win its national cup competition and to qualify for European football.

Last month, it surprised many by holding Everton to a scoreless draw in Dublin before succumbing in the second leg on Tuesday at Goodison Park.

The scheme is sponsored by Irish business and to date 22 young players have benefited from it. It has succeeded in bringing players to UCD whom might otherwise have gone to England or who might never have been able to afford the cost of studying at university.

International links forged

from D.B. Udalgama

COLOMBO

Universities in Sri Lanka are forging more links with those abroad - in the United Kingdom, the United States of America, Canada and West Germany.

Recently the American University of Washington and the University of Colombo drew up a basis for a course leading to an MA degree in international relations.

A Centre for Analytical Research and Development has been set up in a new chemistry complex at the University of Colombo, built at a cost of 16.4 million rupees. It is a collaborative project between the University of Colombo and Dalhousie University of Canada.

overseas news



A matter of public concern

Higher education in Australia is part of the public sector, almost totally funded by the federal government. Tuition is free, fees having been abolished 10 years ago by a previous Labour government. Until recently student places have been in relatively good supply, since that same government gave the system a huge injection of funds in the early 1970s.

A decade of funding neglect also initiated by Labour but enthusiastically continued by the Liberals left universities and colleges of advanced education sadly run down and badly under-staffed. For this reason, higher education organizations including the university academic staff union welcomed the election in 1983 of another Labour government - which promised to restore funding levels and provide 50,000 new student places in higher education by 1990.

But the funding guidelines for the 1985-87 triennium, released in July 1984, effectively cut recurrent funds and provided for only 4,000 extra students beyond current levels by 1987. This is despite an explosion in demand first felt in 1983 which this year has led to tens of thousands of qualified students missing out on places in universities and colleges of advanced education.

As for the erosion of staff/student ratios and library funding and the decline in equipment and capital expenditure experienced under the former government, the education minister, Senator Susan Ryan, has stated flatly that her government will be unable to address these problems in the coming three-year period.

Worse still, the guidelines reveal a disquieting shift in the government's thinking away from public funding for higher education and towards fostering increased private sector involvement.

The 1985-87 guidelines call on universities to "stimulate and facilitate economic development" in the context of "the importance of the revitalization of manufacturing industry in generating economic growth".

This rhetoric is also used by the government to justify its failure to make adequate funding allocations for university research.

The new policies will mean that academic freedom and educational quality are as much under threat from the Labour government as from its predecessors. A free-market approach to higher education and research can bias funding away from the broad faculty mix normally associated with the proper social, intellectual and educational role of the system.

There are also strong rumours that tertiary tuition fees will be reintroduced for 1986, in a breathtaking about-face by a government whose party platform has always fiercely opposed such measures. Even accompanied by a scholarship system, tuition fees would reconstruct a barrier to access for the very disadvantaged groups which the government is concerned to assist.

In this climate, higher education unions can only step up the war of words and attempt to present a sustained and reasoned alternative to the narrow, and instrumentalist view of higher education which currently prevails.

Jane Nicholls

The author is research officer for the Federation of Australian University Staff Associations.

[REDACTED]

What is radiochemistry? The word does not appear in the *OED* and it is tempting to follow Carroll's Red Queen and make it mean whatever we choose it to mean. Historically, the term was first used as the title of a book dealing with radioactivity and the chemistry of the naturally radioactive elements by A. T. Cameron, published in 1910. It was also mentioned in Frederick Soddy's more important monograph on the same topic, the first part of which appeared the following year. However, Soddy did not use the word again in the long series of reports, on developments in radioactivity, that he wrote for the Chemical Society each year until 1920.

Rather later, in the 1920s, the term was sometimes used to describe the study of the chemical effects of ionizing radiations, a topic now generally known as radiation chemistry. Paneth shrewdly noticed that the common feature of radiochemical studies was the techniques and measurements employed rather than some fundamental discipline.

One can, perhaps, conveniently consider it to include those investigations in which chemical information is obtained using nuclear properties or techniques. Thence nuclear chemistry becomes those studies in nuclear physics using chemical techniques. But on this basis radiochemistry would include nuclear magnetic resonance spectroscopy (nmr), which would hardly agree with most chemists' understanding of the scope of the subject.

More profitably, one can look at the work actually accomplished by those working in this area at various times. In the first decade of this century, the primary objective of radiochemical studies was to understand the nature of radioactive decay and to find out the changes in chemical character of the atom accompanying the various modes of decay. It must be remembered that both chemists and physicists were involved in the elucidation of radioactivity and atomic structure. The Nobel prizes won by Rutherford in 1908 and by Marie Curie, alone, in 1911, were prizes for chemistry; although the earlier prize that Marie Curie shared with her husband and Henri Becquerel was the prize for physics (1903).

It was during this period that Soddy made his outstanding contribution to the subject, leading chemists to the conclusion that all the atoms of a given element were the same and that the different isotopes of an element might have different radioactive properties. In the second decade of this century, notwithstanding the upheaval of the First World War, this led to the realization that the different atoms of a given element might have various different masses, but they would possess virtually the same chemical properties provided their nuclear charges were the same.

Separation of plutonium

At a very early stage it was appreciated that the amounts of the short-lived radioactive elements available were extremely small, although easily detached because of their radioactive decay. The question arose how far was it possible to deduce the chemical properties of an element from experiments with sub-microscopic, or tracer, amounts of the element? Since then a great deal has been learnt about the behaviour of substances at very great dilution. It has been found possible to predict the macroscopic behaviour of substances from the behaviour of trace amounts during the precipitation of chemically similar species carried out by Paneth, Hahn and the German school of radiochemists building on the earlier work of the Curies and the Paris school.

Indeed confidence in these methods was such, that in the beginning of the Second World War, the first plant for the separation of plutonium from irradiated uranium was designed before visible amounts of the plutonium had become available.

Although the qualitative laws governing the behaviour of trace amounts of materials in co-deposition reactions are generally accepted, the quantitative aspect of this problem are less satisfactory. Despite post-war work in Czechoslovakia and the USSR, it is difficult to obtain quantitatively reproducible behaviour in these systems, where absorption and colloidal processes are of great importance, and in recent years little progress has been made in this area.

50 years of radiochemistry

This year is the fiftieth anniversary of the discovery of artificial radioactivity by the Joliot-Curies in Paris. The discovery led to a rapid expansion of radiochemistry, which became still more marked at the end of the Second World War, when reactor-produced radioisotopes of most elements became readily available. A. G. Maddock looks back at its development.



Irène and Jean-Frédéric Joliot-Curie, photographed by Henri Cartier-Bresson.

In the years between the two world wars, the emphasis turned to applied radiochemistry. The foundations of the application of radioactive isotopes of elements to the solution of chemical, biochemical and biological problems were laid by Paneth, Hevesy and Hahn. These methods of investigation are now used very widely in a variety of sciences. Diagnostic medical applications have multiplied in the last two decades.

Applied radiochemistry is generally dependent on the identity of the chemical properties of all the isotopes of an element. But it was during this period, when the principle found its first applications, that it was realized that this identity of chemical properties was only approximately true and that small differences in rates of reaction of the different isotopes of an element should be expected. Other small differences in physical properties were predicted and led to attempts to separate the stable isotopes of elements. After much disappointment, these attempts were successful.

In 1934 the horizon of radiochemistry expanded considerably. The daughter of Marie Curie, Irène Curie and her husband Frédéric Joliot discovered artificial radioactivity. They bombarded boron and aluminium with alpha particles, from a polonium source, and obtained radioactive isotopes of nitrogen and phosphorus. The process was similar to that used by Rutherford, 15 years earlier, in the first man-made nuclear reaction, but with the important difference, the product was radioactive.

In the same year Fermi and his collaborators in Rome found that the recently discovered neutron was a still more effective bombarding particle. Practically all elements captured neutrons and gave radioactive isotopes of the element bombarded, especially after the neutrons had lost their high initial kinetic energy in collisions. In one year the possibilities for radiochemical research expanded a thousand-fold.

Man had now set forth on the path that was to lead to the discovery of fission. In the two most experienced radiochemical laboratories, in Paris and Berlin, attention was paid to the rich variety of radioactive species produced by the neutron irradiation of uranium. Using Soddy's radioactive displacement laws it was supposed that trans-uranium elements, a number of five years for Hahn and his collaborators to reach the radical conclusion that neutron irradiation of uranium led to fission and the production of radioactive isotopes of the lighter elements.

During the same period many new kinds of radiochemical research were begun, but with the outbreak of the second world war much of this research was to be conducted in secret. After the war, when most of these studies became public, a very rapid development of radiochemistry took place. Some of it, such as the investigation of the synthetic elements, belonging to the new series called the actinides, was not unlike the work on the short-lived naturally radioactive elements of 40 years earlier.

Among the earliest radiochemical studies using man-made radioactive

species was the investigation of the chemical effects accompanying different kinds of nuclear reactions. Fifty years ago this September, it was reported by Szilard and Chalmers that the neutron capture process usually fragmented the molecule containing the affected atom. This was unfortunate, from some points of view, because it meant that radioactive forms of pharmaceuticals and complex biochemical substances generally could not be produced simply by direct neutron irradiation. Nevertheless, a lot of useful information has accrued from studies of the fate of the radioactive atoms produced in this way.

Effects turned to advantage

These effects can be turned to advantage in some systems. The hydrogen isotope, tritium, T , produced from the rare stable isotope of helium, He , by neutron irradiation, is formed with considerable kinetic energy, forming a recoiling tritium atom. The recoiling tritium becomes a neutral atom and loses most of its excess kinetic energy by collisions with the molecules of the gas in which it has been made. However, it may still react with one of these molecules while its energy is very much greater than the average value for the other molecules in the medium at the prevailing temperature. Such atoms are called 'hot atoms'. Because the tritium is radioactive one can explore the fate of this small population of hot atoms, identifying the products it forms in hot reactions. Hot carbon fluorine and some other atoms can be made in a similar way.

These studies are still providing fruitful, although from a physico-chemical point of view the systems are poorly defined, since the energy distribution of the tritium atoms is not known. The present tendency is to move to the more informative beam experiments, with monoenergetic tritium atoms, but at an increase of several orders of magnitude in the cost of the experiments.

There is always a demand for increasingly sensitive methods of analysis and many of the best methods, at present, are essentially radiochemical. The method of neutron activation analysis will serve as an example. If a material containing, for instance, arsenic, is irradiated in a known flux of neutrons for a measured

time, the amount of radioactive arsenic produced will depend on the arsenic content of the initial material. Other elements in the sample of material may also become radioactive but in many cases their activity can be distinguished from that of the arsenic by the energy of the radiation or by its half-life. In particularly awkward cases the irradiated material can be dissolved, some inactive arsenic added, all the arsenic separated from the other components of the material, using conventional analytical techniques, and the radioactivity of the separated material measured. Quantities of arsenic as small as one part in 10^5 can be measured in this way. Such analytical procedures have been especially valuable in the control of the making of semiconductor materials.

These methods have the unusual advantage that the geometrical distribution of the element within the sample, as well as its amount, can often be determined. This reflects the possibility of measuring radioactivity in situ, for instance, by autoradiography. In this technique the irradiated sample is placed immediately above a photographic plate which is blackened by the radiation emitted. The geometrical resolution will only be good if the radiation emitted has a short range in matter.

What of the present and the immediate past? As in most fields an old topic gains a new lease of life either because of new ideas or techniques. A somewhat bizarre and improbable branch of radiochemistry has proved fruitful over the last few years, the chemistry of positronium and muonium. Any particle positively charged particle is capable of binding with negative electrons to produce a hydrogen-like species. Provided this species survives for at least some tens of pico-seconds ($1 \text{ psec} = 10^{-12} \text{ s}$), it will possess some kind of chemistry. How far we can explore the chemistry will depend on whether the properties of the positive particle provide some means of detecting changes in the state of the hydrogen-like entity. With both the ephemeral species mentioned above the detection depends on the quantum mechanical peculiarities of spin.

The positively charged electron, the positron, is a simple form of antimatter and it disappears rather quickly, annihilating with a negative electron to yield energetic photons of electromagnetic radiation, or gamma rays. However annihilation events are improbable while the positron has much kinetic energy and positrons are

commonly formed, by radioactive decay, with considerable kinetic energy. They lose this, in the medium in which they are released, by ionization and collisions. Thereafter, some fraction of the positrons may capture an electron and form a positronium, which, in turn, may react with molecules in its surroundings.

The positronium formed in this way is of two kinds, depending on the relative orientation of the spins of its positive and negative electrons. All these positronium containing entities, in principle, have different probabilities of annihilation and therein lies one way of exploring the state of the positronium.

Some radioactive materials, decaying with the emission of positrons, emit an energetic photon immediately after the positron. This photon, distinguished by its characteristic energy, is used to start a clock, which is stopped when the photon denoting annihilation of the positron is detected. The lifetime of each positron, measured in this way, is recorded and after accumulation of many events a lifetime spectrum is built up. An analysis of these data gives one the proportion of positrons annihilating with different probabilities and thus the proportions in different chemical states.

Most of the annihilation events are finished in a few nano-seconds ($1 \text{ nsec} = 10^{-9} \text{ s}$) so that one obtains information about events occurring on a very fast timescale. It is perhaps one of the simplest ways of obtaining chemical information on this timescale. Indeed the relative cheapness of this kind of work makes it well suited to our universities at the present time.

Muonium chemistry lies at the opposite end of the cost spectrum. The positive muon can only be produced in very high energy accelerators. The nearest installation where such studies are possible is close to Zurich. As before, the positive muon may capture an electron, when it has lost most of its initially high kinetic energy, forming muonium. The lifetime of the muon has a fixed value of $2.2 \mu\text{s}$ independent of its state of combination. It decays to produce a positron and neutrinos. But another aspect of spin allows one to make useful measurements.

Kinetics of reactions

The muons are produced from a beam of pions, formed in very energetic nuclear reactions. They are polarized so that their spins are aligned with respect to the direction of the beam. This alignment is not destroyed while they dissipate their excess kinetic energy. Application of a magnetic field at right angles to the beam leads to a precession of the orientation of spin. Hence if the positrons emitted in a particular direction are observed the number detected will vary with the time elapsed since the muon entered the system. This zero time can be identified by the ionizing events taking place in the system when the initially high energy muon arrives. Thus the precession frequency, which depends on the state of combination of the muon, can be identified and the proportion of muons decaying in a particular chemical form measured. The muon has a rest mass of about 200 times that of the positive or negative electron so there is a much closer relation between the behaviour of hydrogen and muonium than there is with positronium. For this reason data on the kinetics of reactions provide a valuable opportunity to test the theory of the kinetics of the reaction of hydrogen-like atoms.

This account has dealt primarily with radiochemistry as a branch of fundamental science, although mention has been made, directly or indirectly, of its application to biology, medicine, as well as in radiochemical power industry. Apparently radiochemistry has become a technique that must be acquired by many kinds of scientists.

The training provided by research in radio chemistry serves a man well in many fields of scientific endeavour. Besides a good knowledge of chemistry and radioactivity and at least a reasonable smattering of nuclear physics he acquires a broad knowledge of electronic techniques. Finally, he will always appreciate the need to design experiments with the safety of the operator in mind.

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The Workington Munition Girls' football team, 1917, from Peter Liddle's book *Testimony of War*

One man and his war

Did Peter Liddle choose the First World War - or did the First World War choose him?

Entering his Sunderland Polytechnic archives, looking past the spiked German helmet next to the sticky-tape dispenser, along the walls of books and framed medals, to the metallic filing cabinets stuffed with the paper triumphs and banalities of thousands of 1914-18 lives, it is difficult to tell. Who belongs to which?

The polytechnic must have wondered slightly when he came for interview to teach history to trainee teachers in 1967. (Now senior lecturer in history, aged 49, he has been at Sunderland ever since.) He recalls telling his interviewer: "I think I said I had felt this sort of mission to rescue the past."

But one might already have heard of Liddle as the unusual Liverpool history teacher, who rather than lecturing his comprehensive schoolboys on the history of the Roman Empire, marched them out to capture a medieval castle instead. He taught them nineteenth century history by showing them original documents of Liverpool's Victorian past; then realized that each boy had his own original historical sources and sent them off to grandparents and great-aunts for accounts of the great war and the general strike.

By 1964, the fiftieth anniversary of the outbreak of the First World War, Liddle had settled there - without, he says, really knowing why. He had had six years' experience of collecting documents and interviewing survivors: "I had an increasing awareness that I could do this, that perhaps I ought to do this. And then progressively that I had got to do this, because in some way I was in a position to rescue tangible evidence of what was increasingly a passing memory."

He arrived at Sunderland with several tea chests full of papers, photographs, and miscellaneous objects. The collection had started with Western Front material for a school exhibition. Now it fills three large rooms: experiences of more than 4,000 men and women in the great war.

Liddle, who still works on it every evening and weekend, had no paid support from the polytechnic until 1976 (although the poly has since become far more helpful). Instead he built up a network of contacts and volunteers, many of whom began by donating their own material or reminiscences to him. One goes through reference books and directories - medical directories, Cockcroft's clerical directory, *Who's Who* - writing to every entry of the right age. Others help him collect material - a retired squadron leader in Great Missenden; a Bechill civil aviation expert who records Royal Flying Corps veterans. Others like an international banker in Ryrie, help to summarize and catalogue it. Liddle himself has no archive training, but a certain pride in the all-present and correct cross-reference and catalogue system he has developed

Karen Gold meets Peter Liddle (right), archivist of the First World War, and reports on a conference held on the subject at Sunderland Polytechnic



covering difference areas of experience: battles, officer-men relations, political comments. It is incomplete, particularly in tape-recording transcripts.

His favourites in the collection reflect the cross-referencing: they are usually items connecting a picture and a letter or tape-recording, the tiny pyramids of small things that make up this kind of history.

Thus he recalls a visit to tape-record a Dr Peplow in Lymington, a very religious man who insisted on saying grace over tea and biscuits. "He passed on letters to me, and I read that this field gun battery had adopted a stray mongrel dog which became their pet," Liddle explains.

"When Dr Peplow died, his family sent me some papers which he hadn't given me, and among them was a tiny steel helmet, with the Royal Field Artillery badge. That was the steel helmet made for the dog. And I've got the letters which refer to the dog as well."

Another treasure came from the semi-autonomous camp set up by the Germans at Ruhleben on the outskirts of Berlin for the 4,500 British citizens caught in Germany at the outbreak of war. They were an assortment of opera singers, seamen and industrialists, and they set up schools, banks, football and golf matches and even a Garrison and Sullivan society. But the Garrison British knew about the camp was through two smuggled messages, one in code. Peter Liddle has both, and the pencil too.

His books drawn from the archive material include ones about Gallipoli and 1916; the *Testimony of War* which is a history through documents and photographs; and a projected series: *The Soldier's, Airman's and Sailor's War* of which the latter, the first, is out next year.

They are written to raise financial support for the archive, which otherwise sometimes seems virtually a family affair; brothers and sisters have been recruited through donated material to interviews led to long friendships with Mr Liddle.

But he treats recollections history warily, using little of it in publications and switching off the tape-recorder



Indestructible Tommy... Lieutenant Frankham of the Royal Field Artillery photographed by a fellow officer, from *Testimony of War*

Oh what a lovely debate

The conference dinner menu set the tone. "Soupe de Grevy de Yesterday" it said. "Fromage du Sox du Corporal Pugh" and "Weevilles chez biscuits". That was the survival spirit, with its authentic note of self-mockery, that won the war.

It did not, of course. What - or who - won the war was the great unspoken debate of the conference, *Aspects of the British experience in the First World War*, held at Sunderland Polytechnic. No one would put it so bluntly. But as the Lloyd George supporters lined up against the Haigites, the Europeans against the late-entry Americans, the military historians against the economists, the battle lines of praise and blame were established.

In the vanguard were the big personality historians: John Grigg, biographer of Lloyd George, versus John Terraine, biographer of Sir Douglas Haig and fervent defender of the British generals who, he argued, have had 70 years of bad press.

The main thing about General Haig and all the lesser generals was that in the end, they won, said Mr Terraine. That after all was what generals were supposed to do. The scale of losses and the length of the war were the result of a coalition war with Europeans who did not know any better; indeed, despite the 750,000 United Kingdom military losses from 1914 to 1918, compared with the overall 13 million death toll "in a grim passage in the world's history, we may find it can even be said that the British got off lightly".

John Grigg disagreed: the death toll on the Somme was not justified after September, he argued (the battle raged from July to November 1916); Lloyd George, on the other hand, masterminded a war comparable to Winston Churchill's, without his advantage of a national government and radio broadcasts. The technical historians flew their colours less boldly. But Dr Ian Beckett, of the Royal Military Academy, Sandhurst, put up an elegant defence of the part the amateur soldier, the Territorial unit, played in winning the war. Two territorial NCOs captured Jerusalem by themselves in 1917; nevertheless the regular army discriminated against the Territorials, the Government broke its promises to keep the units together, and the War Office only finally apologized for its treatment of them in 1919.

With the development of air-power during the war, leading to the establishment of the Royal Air Force in 1918, we were back with squabbles between the generals - in this case between the army and the navy which insisted on having its own flying corps - and between Lloyd

George and Haig, according to Dr Malcolm Smith of St David's University College, Lampeter. Air power was useful to solve trench warfare deadlocks, but it was also costly, not least because after German air raids on London there were political demands for both defence and reprisals.

Instead of weakening civilian support for the war, the air raids may have stiffened the nerve. Dr David Sweet of Durham University, emphasized popular support for the war and Lloyd George: in by-elections during the war the liberal candidates standing on a "pursue the war more vigorously" line sometimes won - and were swiftly absorbed into the Tory party - while those arguing for a negotiated peace never did.

Dr Bernard Watkes, of the Open University, pointed out that although there were protests and labour unrest over profiteering, patriotism on the Home Front was staunch. But when news of food shortages began to reach the soldiers, the Government felt obliged to organize a propaganda campaign - speakers sent to France, a film *The Folk Way Back*, paragraphs in popular papers at home reminding families to "smile across the Channel" at their men.

And the men smiled back. That survival spirit was the illustration for the conference brochure - the photographs of indestructible Tommy, teapot and tin mug in hand, perched in the rubble of war - and in the accompanying exhibition: the pin-ups from the dug-outs; the housewives' *Win the War Cookery Book*; the defence plea, written on lavatory paper because that was all the jailers would provide, of the conscientious objector on trial for his life.

It even carried over to the conference. For in the line-up of historians, in reserve as it were, were the survivors. More than 50 1914-18 veterans came to a special reception but some attended throughout. They even argued with historians. "Was there a General Election in 1918?" asked Sir Thomas Hartley, Kt, MBE, DL, veteran of the Western Front and Macedonia, after Dr Sweet had analysed it. "Were the forces given any right to vote? It certainly didn't reach us. It's only today I have learnt there was a General Election."

But it was John Terraine's defence of the generals that provoked history to speak out to the historians.

"A veteran said: 'It has revived memories so that I almost can't express myself. I fought under General Rawlinson at Amiens, when we were pushed forward and then held up. The declaration to lives was appalling. But Rawlinson did his job, and I am proud to have fought under him.'"

The horrors of trench warfare have been harped on for half a century, sometimes as if they were unique to the British alone. The "lost generation" has served as a British wooden-leg, explaining away national decline, ever since the 1920s. The possibilities of a compromise peace in 1916/17 have been thoroughly examined by historians and found to be illusory. All that can be said for and against the generalship of Field Marshal Haig or the war-leadership of Asquith and Lloyd George has surely been said. What is there fresh to be written about Britain's role in the First World War?

For one thing, it can be looked on as an illuminating case study in the still continuing debate about priority of values and purpose in education, especially higher education, with all that a choice of such priority implies for the structure and curriculum.

For Britain found herself waging the war at roughly the halfway point between the peaks of high Victorian educational argument of about 1850-1880 and the renewed national debate opened up by the then prime minister, James Callaghan, in 1976. The education and training system with which Britain went to war in 1914 reflected the outcome or final balance of that Victorian debate, as well as the balance of Victorian opinion in regard to such wider questions as the role of the state and public funds in educating the nation. Given this, it can be argued that if Britain had lost the war by 1916, the prime responsibility would not have lain with the generals or admirals, nor with Asquith and his cabinets, but with such high-minded Victorian advocates of a liberal education as Newman, Mill, Jowett and the Arnolds *per se*, together with the contemporary politicians whose pursuit of *laissez-faire* dogma and low taxes made it impossible for Victorian Britain to emulate the national education systems of Continental states.

For the crisis that might have lost Britain the war by 1916 was not so much military as industrial. The coming of the military stalemate at the end of 1914 ushered in an era of total war, involving the entire societies of the belligerents. Total war in the modern age is an audit of a nation's competitive strengths: industrial, technological and, therefore, directly and indirectly, educational. The audit presented to Lloyd George, as the first minister of munitions after June 1915, of British capabilities was grim indeed. Steel, for instance, is a basic sine qua non of power, fabricated into every kind of industrial and military equipment. Yet Great Britain in 1914 produced barely half the German tonnage, while being particularly backward in the plant and techniques necessary to make high-grade alloy steels, which had been largely imported from Germany. British steelworks, wrote the *History of the*

By October 1914, the German invasion of Belgium - the long-plotted September Plan of von Schlieffen - was well on schedule. The fortress-ring round Antwerp (right) had proved useless and the city was overrun. Stalemate was around the corner but, for the moment, German military technology and planning had proved its superiority.

Seventy years on, as CORRELLI BARNETT and PAMELA HORN (below) describe, the main lessons of the First World War are social - even educational - rather than military. Mons, Antwerp, "First Ypres" put a full stop to the nineteenth century.



Unschoolled in the ways of warfare

Ministry of Munitions, were "behind other countries in research, plant and method". According to that history it was only the ability to import American steel and shells that averted a German victory in the first two years.

A hardly less basic British lack was that of an advanced chemical industry making drugs and dyes that could be partly switched to manufacturing explosives and propellants. Here too Britain had become dependent on German imports; and here too British munitions production in 1914-16 was bottlenecked while new British plant was erected. Moreover, the audit presented to Lloyd George in the course of the daily problems faced by his ministry showed that by 1914 the wide range of high-technology products in which Britain had become dependent on imports, largely from Germany and America, included machine-tools, ball-bearings, magnetos, industrial gauges, glass for electric lamps, optical glass, scientific instruments and photographic equipment and materials. As late as 1918 imports of ball-bearings from Sweden equalled 55 per cent of newly expanded British production. In the case of drugs for the sick or wounded, Britain had no alternative but to continue importing German products via neutral countries. Britain had to create an aircraft and aero-engine industry virtually from scratch; proved a bottleneck because of teething troubles and the competition for available supplies by the production of aircraft, tank and vehicle production. Finally, shortage of skilled labour was pervasive and crippling in many war industries.

Without the ability to draw heavily on foreign technology and production resources, and to pay for them out of accumulated overseas investments, Britain would have been quite unable to equip her new mass armies or create an air force; quite unable to prosecute the war except in such restricted fashion as must have exposed France to probable defeat in 1916 (the year of Verdun), and led to German domination of Europe.

Historians have offered various explanations for this British decline from technological leadership in the 1840s to relative backwardness in 1914. However, one factor was seen at the time, and continues to be seen today, as of crucial importance in that decline: the quality, quantity, and content of British education compared with that of our competitors, above all Germany. For research and development are the key to advanced product design; product design (and not merely price as old-fashioned economists believed) is the key to winning markets; and the education and training both of research and development personnel and of production personnel is the key to the whole sequence.

In 1914 Germany went to war equipped with more than 20 universities, 10 technical high schools of university rank (with 10,000 students) and a nationwide coverage of excellent polytechnics. Below the tertiary level it possessed a network of trade and commercial schools from which had come the technically knowledgeable shop-floor workforce that has so impressed the Samuelson Royal Commission on Technical Instruction in the 1880s. All these research and further-

education-and-training institutions rested in turn on generously funded universal primary education inaugurated some 70 years earlier than England's and secondary schools the number and quality of which even in the 1860s had been the envy of the Schools Enquiry Commission. Little wonder that German research and development industrial management and production workers had placed Germany in the forefront of the new technological markets that had developed between 1870 and 1914.

Britain went to war equipped with 13 universities and eight university colleges, with a total student population of 26,000, which may be compared with Germany's total of 24,000 science students and Cambridge accounted for 7,700 students, or more than a quarter. In these ancient foundations science and technology were recent and relatively minor newcomers, small in student numbers. In 1914, for example, just 21 students were reading engineering at Oxford, the chair in engineering itself dating only from 1907. The Oxbridge scene was still overwhelmingly dominated by the classics and pure mathematics, together with such useful arts as modern history and literature. The Clarendon and Cavendish laboratories dated from the early 1870s, some 50 years after comparable German institutions; and excellent and full of future promise though the work of the Cavendish was, its immediate usefulness to British industrial capability was small. It could not be said, therefore, that Oxford and Cambridge, though dominant in student numbers and in

prestige, weighed much in the scales of peacetime economic success or wartime survival.

It was London University, including Imperial College, and the new provincial universities and university colleges which had seen as a major function from the beginning that of serving industry or particular industries, both in terms of research and of degree courses; and so helped to redress to some extent Britain's overall marked inferiority in higher technological education. By 1914 the quality of their industry-related research equaled or surpassed Germany's but its quantity, and likewise the quantity of the production of graduates, remained a fraction of Germany's. At Birmingham, for example in 1914 there were 185 full-time students reading engineering and technology; at Liverpool 122. The respective figures for pure science were 114 and 168. Moreover these limited British developments came some 50 years after the founding of the German technical high schools in the 1830s.

At a lower level, British technical education in 1914 still remained fragmented, limited in scale and underfunded compared with Germany's, with nothing to compare with the German polytechnic system; about 3,000 students in some 30 technical schools, compared with 14,000 in German technical high schools alone. Courses for City and Guilds of London trade examinations provided only a limited response to the German system of trade and commercial schools. The secondary schooling reforms of the 1902 Education Act had not yet far from redressed the British



Marching to the front... of the six million men who served in the British forces 723,000 were killed

inferiority in numbers and quality of this key sector of education; by 1913 transfers from elementary to secondary schools were still only a quarter of the figure hoped for, while some three-quarters of British young people between 14 and 17 were under no form of education at all. In the emergency of 1914-1916, therefore, industry and the suddenly expanded armed services were fishing for skilled tradesmen and sheer educated intelligence for junior leadership in a very limited pool.

The industrial crisis of those years, imperilling the nation's survival in a total war, and the educational attitudes and neglect that had thus contributed so signally towards it, demonstrated the essential frivolity of the case made for a liberal education in the high Victorian era, and as still enshrined at Oxbridge in 1914. Take Newman, for example, in 1852:

I consider I am chargeable with no paradox, when I speak of the knowledge which is its own end, when I call it liberal knowledge, or a gentleman's knowledge, when I educate for it, and make it the scope of a University. Knowledge, I say, is especially liberal, or needs no end beside itself, when and so far as it is philosophical.

And: *Liberal education makes not the Christian, not the Catholic, but the gentleman. It is well to be a gentleman, it is well to have a cultivated intellect, a delicate taste, a candid, equitable, dispassionate mind, a noble and courteous bearing in the conduct of life; these are the constant qualities of a large knowledge; they are the objects of a*

University. It should be recalled that the essence of this liberal education for Newman and other influential voices such as Jowett, Mill and Matthew Arnold was that it trained the intellect for its own sake, instead of, in Newman's words, "being formed or sacrificed to some particular or accidental purpose, some specific trade or profession or study of science". Such an education, averred Newman (and this was Jowett's view also), prepares a man "to fill any post with credit, and to master any subject with facility". Mill similarly argued in 1867 that a university "is not a place of professional education". He acknowledged that there were advantages in having schools of medicine, engineering and the industrial arts but they were needed "only for the comparatively few". Even though Matthew Arnold had previously pointed out the relationship between Prussian education and Prussia's victory over France in 1870, he was arguing in 1882 that "knowledge" that cannot be directly related to our sense for conduct and our sense for beauty are more "instrumental knowledges". Hence the overriding value of Greek as part of our culture.

The assumption of the Victorian liberal education men was that rule mechanicals trained in inferior institutions would maintain that fabric of material prosperity and national security which supported their own rarified pursuit of moral and intellectual excellence. It is the assumption of the Italian renaissance courtier absurdly applied to the education of the ruling élite of an industrial power faced with rising world challenges; the intellec-

tual equivalent of Pugin's and Morris's aesthetic escapism.

The relevance of the liberal education lobby, the views of which have been briefly summarized above, to the national peril of 1914-1916 lies in that it essentially won the Victorian debate against those who, in the words of Herbert Spencer in 1861, argued that a liberal education "neglects the plant for the sake of the flower", preferring elegance and polish to knowledge related to self-preservation; and who believed that "that which our school-courses leave almost entirely out, we thus fund to be that which most nearly concerns the business of life". For the Victorian triumph of the liberal education men had far-reaching consequences in terms of the inadequacies of British research and development and British technical education at all levels in 1914. In the first place, it preserved the domination, in numbers and prestige, of the arts and pure mathematics at Oxbridge, so conducting to Oxbridge's small contribution to national competitive capability at the time of the outbreak of the war. Cambridge even turned down the offer of an endowed chair of naval architecture in 1903 rather than scrap Greek as a necessary qualification. The principal real-world function of Oxbridge throughout the nineteenth century had been to turn out clergymen, schoolmasters, civil and imperial servants, and politicians, not a technological élite.

Second, the prestige of Oxbridge relegated the new provincial universities to the second-class rank of red-brick institutions with chairs in jam-making (to cite one Oxbridge snoot).

And in deference to Oxbridge values even the new universities gave generous place to the liberal arts despite their limited places; getting on for half the total at Birmingham in 1914; more than half at Bristol; more than a third at Sheffield. A trend was already under way which can still be observed today: for higher educational institutions in Britain, especially those with an originally utilitarian purpose, to move "up-market" into liberal studies.

Third, the dominance of Oxbridge in terms of prestige and the victory of the liberal education men together exercised a pervasive influence on the development and ethos of the whole British education system through its alumni in Parliament and Whitehall, indeed through British governing-class culture in general. The indifference of this governing class to the educational requirements of industrial success, indeed the very hostility of its culture to industrialism, supplied the major factor in the failure to carry out fully and on the largest scale the reforms in school and technical education advocated by the Victorian royal commissions. Indeed, through the medium of Sir Robert Morant, permanent secretary to the Board of Education from 1903 to 1911 (Winchester and New College; great, then theology), and J.W. Mackail of his staff (Balliol, later professor of poetry at Oxford), who actually drafted the regulations of 1904/5, it directly caused the swing of elementary and secondary school education after the 1902 Act away from a technical or vocational bias towards liberal or "academic" education. Morant had, of course, already been responsible for the destruction of

the technical higher elementary schools in the Cuckerton case. Moreover, the top-downwards influence of Oxbridge examination boards also helped to bias the whole education system in favour of the academic approach, so that even those children who had no hope of reaching a university or even a sixth form received a smudgy carbon-copy of a liberal education rather than one related to their own and national needs.

The victory of the liberal education lobby in the Victorian debate, especially in winning the "high ground" of Oxbridge, was thus a major factor in Britain's weakness in research and development and technical education at all levels up to 1914, and hence in bringing about the munitions crisis during the first two years of the First World War. Whether the Oxbridge generalists' service to the country in the war in their own chosen spheres justified the particular claims made for a liberal education by its protagonists is another topic, and one too large to explore here. However, it is debatable, to say the least, whether those claims are borne out by the collective sagacity of Asquith's cabinets in 1914-16, or whether we should admire such products of the subtlety of the Cambridge moral-sciences mind as the Balfour declaration. Certainly Lloyd George recruited the leaders of his new ministry of munitions from the more thrusting sections of British industry rather than the Oxbridge-educated civil servants, with (in his opinion) their mandarin concepts of correct procedure and the detached, balanced view. However, it must be acknowledged that the lost generation of Oxbridge young graduates, figures of future myth like the Grenfell brothers, made junior leaders in front-line operations probably as good as the NCOs who often commanded equivalent-size German operations. And Oxbridge unquestionably produced the ideas men of wartime, as Newman and Co. would have wished - pacifists like Bertrand Russell, League of Nations men like lord Robert Cecil, who successfully peddled the belief that armed conflict between powers could be abolished if all signed a covenant promising to behave. Moreover, Oxbridge ideas men were to be largely responsible for eventually losing the peace which wartime British concentration on industrial performance helped to win. For it was from the ranks of Newman's liberal, Christian gentlemen, with his "cultivated intellect, delicate taste and noble and courteous bearing in the conduct of life" that emerged the leading advocates of appeasement, and even the occasional idealistic traitor.

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How the landed classes were

During the 70 years that have elapsed since the outbreak of the First World War, memories have inevitably concentrated upon events on the battlefield itself. Yet, recent studies have tended to concentrate on what Angus Calder - describing a more recent conflict - has called "The People's War".

The imminence of hostilities seemed a challenge rather than an event to be feared. Apprehension was matched by a sense of relief that the weeks of rumour and speculation were at an end. At the village of Fletching in Sussex - typical of most such places - the headmaster of the local school described the prevailing mood in the middle of August: "Another week of excitement, everyone restless and ready to discuss war news on the slightest provocation. Every night there is a rush for the evening papers..."

The sense of commitment was nowhere stronger than among the landed classes. Not only did they enjoy traditional links with the county yeomanry regiments, but the officers of the regular army were normally drawn from their ranks. They included men like Julian Grenfell, eldest son of Lord and Lady Desborough and already in 1914 an army officer. He regarded the break with peacetime life as a welcome change from a predictable social round and as a fulfilment of that destiny for which his education and training had fitted him. "It must be wonderful to be in England now," he wrote shortly before returning home with his regi-

ment from South Africa. "I suppose the excitement is beyond all words... It reinforces one's falling belief in the Old Flax and the Mother Country and the Heavy Brigade and the Thin Red Line and the Imperial Idea which gets rather shadowy in peacetime, don't you think?"

Others shared the anxiety of Sir Oswald Mosley, son of a Staffordshire landed family, that they must join up quickly so as not to miss any of the action. "Our one great fear," Mosley wrote of his generation, "was that the war would be over before we got there." Events were to show how needless that particular concern was. Indeed, Mosley himself was invalided out with an injured leg before he was 20, after service in the air and trenches.

The first to be mobilized were the reservists and the members of the Territorial Army, who marched or rode away from home and friends to the stirring accompaniment of bands and the cheers of admiring onlookers. Elsewhere, as at Little Waltham in Essex, a labourer remembered how several of his fellows, who were reservists, were called up out of the harvest field. He himself stayed behind to complete the harvest, before responding to Lord Kitchener's appeal of August 7 for 100,000 new recruits. He joined the Royal Artillery and was sent to Woolwich to begin his training - his first visit to London.

Overall, by January 1915, perhaps 15 per cent of workers employed on the land in July 1914 had left the

Industry for the armed forces or for employment in munitions factories and similar work. In Wiltshire and the counties on the south and south-east coast, much labour was diverted to the erection or extension of military camps. According to A.G. Street, who farmed near Salisbury, by early 1915 the farms in his area would have been denuded of hands but for the fact that the married men lived in tied cottages and could not move without losing their homes. "Boys who were not yet of military age were at a premium and could get three times as much money as their fathers by working for the contractors who were constructing the new camps... Young carriers for camp-bus, especially in demand put to it to man our six two-horse single-furrow plough teams."

Meanwhile the female members of the population set up branches of the Red Cross to provide rudimentary first aid training, or formed sewing and knitting parties to make "comforts" for the troops. By August 8, the *Norfolk News* was reporting Red Cross appeals for volunteers and pointing out that at Cromer a working party had started "making night-shirts, bed jackets, &c". In the weeks that followed, such organizations proliferated. Even the Girl Guides joined in, learning to roll bandages, receive telephone messages and similar tasks while the Boy Scouts acted as messengers or as guards against the possible sabotage of public utilities. For rumours were soon rife in

brought right down to earth...

many small communities that the enemy planned to pollute the water supply. At Calne, Wiltshire, to quote one of many such instances, there were reports of two "suspicious individuals" loitering in the vicinity of the Calstone reservoir. The water company reacted by arranging for the reservoir to be kept under constant surveillance. Needless to say, the rumours proved groundless.

Impromptu home guard units were recruited in some market towns and larger villages while a number of landowners constructed rifle ranges so that men could learn to shoot before they joined up. The village poacher, hitherto regarded as a threat to pheasant coverts, now became valued as a potential sniper.

Not was this all. As the *Mark Lane Express* commented, there was something almost medieval about the idea of drilling the youths of the village on the green... but this is happening, with old soldiers acting as instructors". At one Cumbrian village, the *Westmorland Mercury* noted how 80-year-old ex-soldiers were being recruited to teach the youngsters to shoot.

In the upsurge of patriotism, numerous country houses were offered for use as hospitals and convalescent homes, to cater for the expected casualties. According to the *Nottingham Weekly News* the authorities had been "literally inundated" with offers of properties, ranging from John O'Grady's to Land's End. The landed classes took a lead not merely by offering their homes and

their sons for war purposes, but by their zeal in promoting recruitment among their employees. Occasionally this was even combined with a financial inducement. The Earl of Ancaster circularized workers on his Lincolnshire and Rutland estates, encouraging them to join up by promising to keep a situation open for them on their return, guaranteeing an income for their wives and families and allowing the families of volunteers to live in their cottages rent free. In addition, any man who enlisted was offered a bonus of £5. The move seems to have been effective, for within a week 22 men from the estate had volunteered and had been driven in motor cars lent for the occasion to have a medical examination at Stamford.

It was this approach which was later castigated by the agricultural writers, F. E. Green, when he described bitterly how: "The farmer's boy, so long despised, was appealed to by patriotic songs sung by fine ladies to defend them and all English women; and the rich man's car swiftly sped these lads to the nearest recruiting station. Then it was that the well-fed, well-housed lads reared in a shock the number of lads reared in country cottages, who had to be rejected on account of rapture, varicose veins, defective hearts and bad teeth. Then, too, it was that the man who could swing an axe, who could turn a furrow, or milk a cow, was acknowledged to be of more importance than the man who spent his days in driving a ball across a common or

lounging about a club." The early faith in a speedy British victory was soon eroded by events on the Western Front. In all, about 723,000 of the six million men who served in the British Army, Navy and R.E.F./R.A.F. between 1914 and 1918 were to be killed and about 1.67 million wounded. It was against this background that C. F. G. Masterman claimed emotionally that in the retreat from Mons and the first battle of Ypres, during 1914/15, the flower of the British aristocracy had perished. Already by the end of 1914, the dead included at least three peers and 52 peer's sons. While from the "other ranks" letters arrived at cottage homes which bore little resemblance to the optimistic effusions of the popular press. As a young Worcestershire man wrote in the autumn of 1914, the "bodies lie on the ground over the space of a mile as thick as sheaves after the self-blinder in the harvest field. Sometimes explosions lift men eight or nine feet into the air and then they simply go to pieces".

The impression made on families at home by such disclosures must have been shattering. Already a gap was emerging between those who experienced the horrors of war at first hand and those who merely read of them. In the years ahead that gap was to widen, as the true nature of the grim struggle which lay ahead manifested itself.

Pamela Horn teaches at Oxford Polytechnic.



Two aspects of country life... once the men joined up the necessary tasks fell to women and children



British infantrymen await the enemy in Belgium while (below) the press at home take a lighter view of the war



Journalist Correlli Barnett is fellow of Churchill College, Cambridge.

Bernard Crick



The mixed-up morals in religion and politics

My good German friend's communion motto was "Fight the good fight" and that was always one of my favourite hymns. I am almost tempted to re-enlist to have a better status to join in the fight.

I would like to answer back, from the theological dead centre of the Anglican communion. Brother Butts and Brother Gummer's hysterics against the Bishop of Durham. But, alas, I am a vice-president of the British Humanist Association, worse, there is a framed certificate (in a cupboard modestly, not on my wall embarrassingly) that states that "on the first day of September, 1983 Bernard Crick has been elected to the Academy of Humanism and awarded the title of Humanist Laureate", and it is signed by Antony Flew (please note the name), Sidney Hook and Gerald Larue.

Like the bishop, my orthodoxy could be questioned. I probably would not be among the bench of humanist bishops at all if the editor of the published proceedings of their 1971 conference, "Towards an open society", had not struck from my proofs the remark "so many rationalists appear not to disbelieve in the existence of God so much as to dislike him personally." He kept the legend of my sacerdotal purity.

Otherwise I would re-enlist in the C of E quite easily, since I was confirmed by an archbishop of Canterbury and prepared by a bishop of Croydon, the last words of whose instruction I have never forgotten: "And remember, boys, on the day when the Archbishop's hands descend on your head, you are then one with God the Father, God the Son, God the Holy Ghost and a full member of the Catholic Church of England and no hair oil."

I have never believed that it was possible to be precise about the border line between the secular and divine. Principles are not modified by the real world of contingencies, but they must be applied in a specific real world.

A contingency of 1944 was, indeed, hair oil, for we let our hair grow back and long (as long as long then was) in imitation of the Battle of Britain fighter pilots whose smoke-trails we had watched three summers before. To be strict, not oil for us (too expensive, unless stolen from father's bottle) but Brylcreem, usually in half-penny dollops from a machine at the public baths which, if one was quick and dexterous, one could usually share with a friend.

It has always struck me, as a political philosopher, that most of our western culture has been shaped by the peculiarity of Christianity not being purely otherworldly. Somehow, in Hegelian terms, Christendom could subsume the Greek moralizing of political life, neither cancel nor abolish it.

Now not for one moment do I doubt the sincerity of Brother Butts and Brother Gummer's arguments that they are helping the poor by attempting to recreate an expanding, competitive and wealth-creating market economy. They are frightfully sincere; I only think that their theory of the best way to help the poor is, quite obviously, somewhat indirect and, more contentiously, not the only one to command respect.

Politics for the Christian is, surely, a dilemma: part of the condition of fallen man. The popular press has been clamouring that the bishops should "keep out of politics". Their hypocrisy is disgusting, if they see themselves as

Christians or think that they can, without a whole sociology of qualifications, represent their readers as such. And philosophically their view is absurd - of a piece with those who argue that one must keep this and that, sex and politics are favourites (they have at least that in common) out of secondary education.

The amorality of the intention is at least as breathtaking as the impossibility of the result. The sensible course is to debate, as rationally as one can, how these matters can be taught and understood when there is no consensus as to values.

Similarly with the Church of England. The Church can no more keep out of politics than politicians can avoid courting, reprimanding, limiting or trying to control the Church. The Church is divided. But so is the nation, haven't the Butts and the Gummerts noticed? Or are they themselves like a nation exalted with self-righteousness?

If the Church or the nation is divided, its members must reason among themselves as earnestly and tolerantly as they can about the rights and wrongs of an issue. But they must both accept that the issue of the miners' strike is, in part, a moral issue, or if it is in largest part a practical issue, it has a necessary moral component without which the practical matters cannot be resolved. What is foolish is to try to pre-empt argument by saying that the Church must not intervene at all (or if so, on rare occasions, only on our side).

What is really angering the Butts and the Gummerts is not simply that bishops criticize the Government, but that they try to moralize issues of power at all. Such politicians talk a lot about the importance of morality, but this truly moral controversy shows how instrumental is their sense of morality: the behaviour that maintains the kind of society they like, hence manners and morals are totally confused.

In fact, like the popular press, they don't wish to discuss the merits of the case, but rather to blow a whistle and say it should not be discussed by the Church, teachers, disc jockeys or whatever.

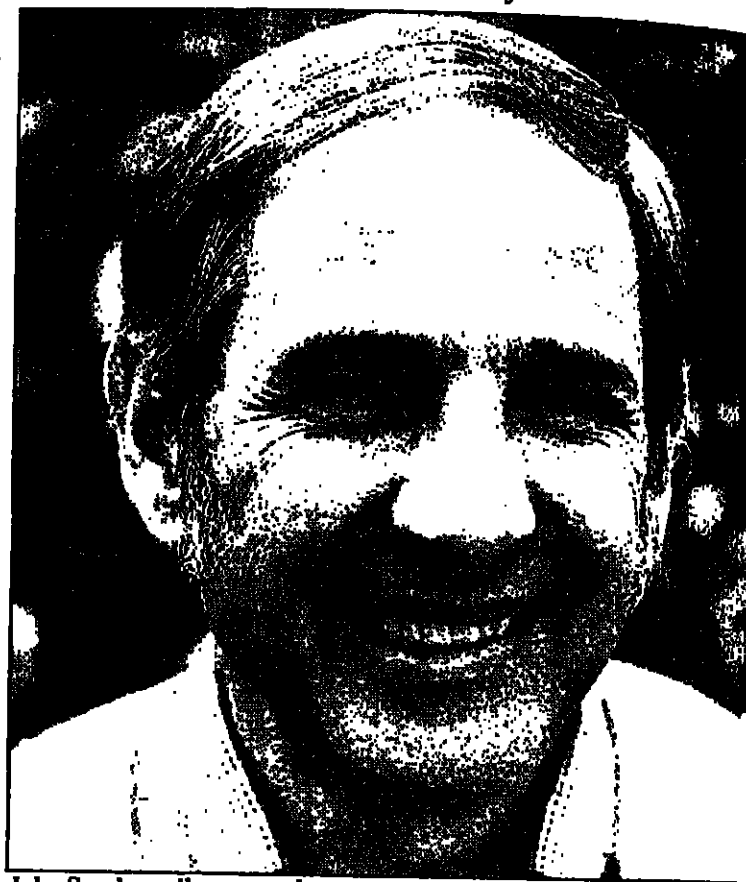
I mentioned Antony Flew's signature on my certificate of humanist episcopacy to draw attention to the fact that politics divides those of us in limbo as much as those of you in heaven. Professor Flew certainly believes, in a tough, dry logical way that humanist individualism implies political and economic individualism. Whereas I believe, in a sloppy, wet, humane way that humanistic individualism points to our mutual interdependence, to our sociability and to the possibility both of mutual aid and of using the state beneficently.

But I am not a utilitarian, or if so, only in a very qualified sense - J. S. Mill's "higher values", after reading Wordsworth and escaping from a rational education, "the creative spirit" and all that. In determining matters of public policy there is no way, either by Bentham's logic or Hayek's, that reasoning about moral values can be excluded. Oddly I think that Christian and humanist have that in common: a secular world (or to them, that aspect of the world that is secular) is not to be shared as well as private morality. I believe Hannah Arendt explained all this quite clearly in *The Human Condition*.

But when I was asked to give the briefing paper on Northern Irish politics to the Joint Council of Churches' Liverpool meeting of 1973, was I asked as a technician or a humanist moralist? I should have asked them, but it didn't seem to matter - a bit of each.

Trevor Pateman profiles the American philosopher John Searle, who begins his series of Reith lectures on BBC radio on Sunday

A fighter who runs away with all the prizes



John Searle: pulls no punches

Wittgenstein once remarked that a philosopher who doesn't engage in public debate is like a boxer who never enters the ring. By this standard, John Searle, professor of philosophy at the University of California, Berkeley, is a true prizefighter. In recent years he has taken on Noam Chomsky, the champion of modern linguistics; Jacques Derrida, the heavyweight of post-structuralism; and endeavoured to deal a knock-out blow to the pretensions of the artificial intelligence. To his critics, he is punch drunk.

But that can't be true, because Searle is also a constructive philosopher who in his books *Speech Acts* (1969), *Expression and Meaning* (1979), *Intentionality* (1983) has sought to present simply and systematically a vision of language and mind which draws on a rich background in modern philosophy. What is this vision and how does it relate to Searle's contests with Chomsky, Derrida and computer theorists?

Searle's vision is a naturalistic one: we cannot understand mind and language, he says, except on condition that we connect them to human beings as biological organisms, embodied and embedded in the physical world. Our ability to do this is towards the world (our "intentionality") - to believe things about it, desire things in it, and to express those beliefs and desires in language - is something we possess as a casual consequence of having the sorts of bodies (including in our bodies, our brains) that we have.

This biological naturalism aligns Searle with the later philosophy of Wittgenstein and, in the most recent work, with Heidegger, as mediated to Searle through the work of his colleague, Hubert Dreyfus. It immediately opposes Searle to many of the proponents of artificial intelligence.

For it has been fundamental to AI research (at least until very recently: David Marr's *Vision* represents a new direction) to think that mind can be understood apart from body, just as software (programs) is quite distinct from hardware (computers). The AI model of the mind is one which abstracts from and denies the relevance of its neural basis and concentrates instead on its functional or structural properties. Searle seeks to explode the plausibility of AI simulations of mental phenomena by means of a single, simple and - by now - notorious thought-experiment, the Chinese room.

Searle invites us to imagine him locked in a room into which is passed batches of Chinese writing (he doesn't read Chinese) together with rules in English (and he reads English) allowing him to correlate bits of Chinese writing across the different batches. This is sufficient for him to receive material in Chinese and, to outsiders, appear to answer in Chinese questions about it.

But does he understand Chinese as a result? Not a bit of it, says Searle; I merely coordinate one bit of Chinese which I don't understand (say a "question") with another bit of Chinese (say an "answer") which I don't understand either. But I produce the appearance of understanding. And in this I am just like the computer programs devised by AI researchers: I do no more than manipulate uninterpreted (formal, syntactic) symbols.

But symbol manipulation is not understanding and, it follows, the computer program therefore neither understands nor simulates understanding. It is the users of the computer program who attribute meaning to its operations: the meaning is not intrinsic, as it is in humans.

Searle's argument is meant to show that the computer programs don't literally understand things and that we wouldn't understand things if all we had in our minds were computer

programs. We also need bodies, or as Searle puts it, "only a machine could think, and indeed only very special kinds of machines, namely brains and machines that had the same causal powers as brains", for mind is a causal realization of body.

What are we to make of this argument? My own view is that Searle is both right and wrong. He is right to insist that programs do not show understanding, and that perhaps right that they could not. But neither do bodies or brains show understanding. It is to persons that we attribute understanding, beliefs, desires, etc. being a person that you have a body, but it may equally be necessary that you have a mind in which sub-personal processes of a computational character take place and which eventuate in the understanding, beliefs, desires, etc. of a person. It is then entirely appropriate to seek to explore and model those sub-personal processes through AI work.

Searle's naturalism is also involved in his critique of Derrida. Searle makes the familiar point that a great deal of the western philosophical tradition is a search for secure foundations or "guarantees" for knowledge, typified by Descartes' search for certainty. The twentieth century claim to be found in the work of Heidegger and Wittgenstein, that there are no metaphysical foundations to knowledge meets two responses.

First, that this leaves everything as it is - this is Wittgenstein's and Searle's naturalistic response. As Searle puts it: "The only foundation that language has or needs is that people are biologically, psychologically and socially constituted so that they succeed in using it."

Second, the response that in a world without certainty, everything is permitted. In the nineteenth century, this thought anguished a writer like Dostoevsky; today, Derrida proclaims it as the new joyful wisdom. Searle thinks Derrida's position vitiated in the same way as all relativisms: it presupposes what it sets out to deny, for the claim that everything is permitted is itself a claim to truth.

Biological naturalism opposes Searle to AI and Derrida, but it does not oppose him to Chomsky, for whom most interesting properties of language and mind are innate, part of our biological inheritance. In fact, Searle's quarrel with Chomsky is that he is too much a biologist and too little a sociologist.

For Searle, as for Heidegger and Wittgenstein, mind and language are intrinsically social and cultural, as well as biologically rooted. Chomsky sees only half the picture; his biological naturalism is too restrictive. In particular, he studies language without reference to the use of language in communication and treats syntax as autonomous with respect to semantics.

In consequence, Searle argues, when Chomsky explains the growth of syntactic competence in the child in terms of the triggering of innate mental

structures, this is not a freely arrived at hypothesis. Rather, it is the position to which Chomsky is driven by his initial restrictive assumptions.

If these are relaxed, it is possible to imagine different explanations of syntactic development. For example, Chomsky argues that syntactic features of the interrogative are only explicable by assuming that they are innately specified. In reply, Searle points out that if you are willing to note that the interrogative is standardly used to ask questions, and that success in asking questions depends on being able to identify the referent of the question, etc., it becomes rather easy to explain what looked like esoteric facts of syntax. In short: "An understanding of syntactic facts requires an understanding of their function in communication since communication is what language is all about."

On the same lines, Searle argues against Chomskyan semantics that meaning cannot be understood apart from the use of language. The arguments against Chomskyan semantics are analogous to those deployed in the Chinese room example.

Thus, in one brand of Chomskyan semantics we are simply offered parodied adult male. But this sort of analysis is circular and presupposes the system it is supposed to explicate: one bit of English is correlated with another bit of English, but that cannot elucidate what is involved in understanding English.

In another brand of semantics (due to J. J. Katz), we are told that "bachelor" means (+ MALE, + ADULT, + HUMAN, - MARRIED). But the capitalized words belong to some new language which might as well be Chinese; no account is given of how we are supposed to understand it.

Searle's alternative to such approaches derives from the work of the English philosopher J. L. Austin, whose ideas were systematized in Searle's first book *Speech Acts*. In this alternative, a theory of meaning involves giving rules for the use of expressions in speech acts, rules which enable us to refer to things and predicate things of them. For "speaking a language is a rule-governed form of intentional behaviour and the rules are of the sort which speakers ought to follow in asking questions, making promises, giving orders and so on."

Whereas Chomsky thinks of rules of language as non-introspectible mechanisms, for Searle they can be brought to self-consciousness by an act of recall (Plato's *anamnesis*). Whereas Derrida wants to sever language from intention, for Searle language is inseparable from intentional, communicative behaviour. And whereas cognitive scientists think of rules as between us in society, We can be sure of a provocative series of lectures.

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Meaning without stating

by A. K. Thorlby

Fictions of Romantic Irony in European Narrative 1760-1857
by Lillian R. Furst
Macmillan, £22.50
ISBN 0 333 25877 9

Professor Furst's previous books on Romanticism, in the literature of England, France, and Germany, have already established her reputation as a comparativist scholar. The present study displays again the same virtues of methodical presentation, aptly illustrative quotation, clarity of thought, and just acknowledgment of received views. In this, it conforms to an academic ideal of cumulative learning and of general truths defined and demonstrated on the basis of particular texts. Since a major theme here is the essential unreliability of texts, and by extension of all knowledge, there is an irony in the painstaking thoroughness of this scholarly study of them. But it is unintended. This book is innocent of the kind of all-embracing, metaphysical irony about which it speaks with the didactic seriousness appropriate to a graduate seminar.

It is a conception of irony which derives from Friedrich Schlegel; just what kind of seriousness he attached to it, I should not estimate. He certainly wrote for a very different audience, around 1800, when a small, late-born intelligentsia in Germany had to become a cultural world-power (in compensation doubtless for their actual historical situation). Ideas were a way of circumventing reality, they gave a sort of possession, and dominance over other people's culture, beliefs, books. At the same time, ideas liberated their possessor from any commitment even to his new possessions; they were able to rise endlessly above themselves; their freedom was limitless but also destructive. Little else remained but human consciousness besides sheer "agility", on which Schlegel seized in order to define irony. When he associates it in the same breath with "total chaos", one may suspect some self-irony, or even self-parody, for this he also considered to be an attribute of the endlessly progressive spirit of Romantic Intelligence. To rise continually above one's own ideas is to take none of them seriously; their seriousness is reduced by irony, only the irony itself is serious. The two attitudes become indistinguishable; the kind of contradiction of opposites that appealed to the wildly intellectual contemporaries of Hegel, though mercifully most of what Schlegel had to say about irony is expressed briefly in aphorisms. He cultivated this form of expression, which releases an idea from dependence upon either systematic argument or evidence; in aphorisms ideas are contained in a privileged, protected form resembling that of art.

This is not the first time that irony and a idea of irony has been taken out and applied systematically. The result tends to be, as one earlier scholar recognized, that too much emphasis is laid on the negative effect of irony. In this book, at least three wittily ironical works are analysed in such solemn terms that one begins to wonder why anyone should wish to read them: Byron's *Don Juan*, Denis Diderot's *Jacques le fataliste*, and (of course) Laurence Sterne's *Tristram Shandy*. A computer print-out of a roller coaster's movements would also not give much idea of the fun in the ride. The extent to which everything in *Tristram Shandy* is topsy-turvy is carefully recorded here: our sense of time, of space, of sequence, of purpose, of who we are and what we are doing, Professor Furst does not say anything as frivolous as topsy-turvy; she finds irony in much more sombre characteristics of Sterne's prose - so much so that it is hard to see what can redeem them as a whole.

[Irony] seems to be nowhere special because it is everywhere: in the ambiguity of the empty spaces, in the subjectivity of the time-scales, in the reiterated reminders of the unsteadiness of words, in the problematical relationships between narrators and readers, in the incessant pointers to the fictionality of the fiction being created, in the dominance of contingency, and in the insubstantiality of the private versions of the truth.

No matter if this novel's ponderous language - "incredible" in Heine's opin-

ion - "makes the things it describes opaque, not clear . . . Its discontinuities are symptomatic of the chaotic absurdity of a world swayed by contingency." No matter if nothing very substantial can or does live in this medium: "What it loses in concrete palpability, it gains in the enormous power latent in its persuasive paradoxicality."

The quality of Byron's humour in *Don Juan* could scarcely be over-looked, but it can be set against a seriously negative view of existence, on which Professor Furst insists: If this is intellectual fun, it is also intellectual torture. For the disruption of norms entails, too, the erosion of certainties, just as improvisation, while capturing life's fluxional nature, begets also a disconcerting sense of the insecurity of things. The jolting discontinuity of *Don Juan* is a disturbing indication of the fundamental instability of the narrative as of the universe.

Here the irony which produces this upsetting view is called upon also to transcend it. This double and opposite action is, of course, an important feature in Schlegel's definition of irony; it reflects the widespread interest of his generation in the power of art not only to mirror but also to transform the world. The philosophic idealism of that time, of which Professor Furst has made herself a knowledgeable exponent in our own, rests largely upon a belief in this creative transformative power in human intelligence altogether. Art, therefore, and especially the fictions of artistic form, offer a lesson of great philosophic importance. Instead of resting content with the paradox that the damage done by satire is the source of its delight, Professor Furst tries to estimate the ideological energy in Byron's ironic style by showing how it overcomes the "nihilism" of the poem. It is irony, she claims, which enables him to transcend this nihilism into something like Friedrich Schlegel's "transcendental buffoonery". Irony "acts as a force of reconciliation"; it is "the butcher for demolition and it serves too as a rescue ladder to climb out of the crumbling edifice."

These not entirely persuasive expressions betray just how hard it is to define an ironical effect; and it is harder still to follow German Romantic speculation in attributing some general philosophical significance to irony [either by its own force or by the full ironic vision in Sterne (to a lesser extent also in Jean Paul and Diderot), because he uses irony not just at particular moments within the story but with regard to the entire telling of the story. He "ironizes" the text. This is bound to have big ideological implications for a modern critic, releasing thoughts of "perspectivism", "relativity", and the arbitrary nature of language, which nowadays signify a kind of liberation from the oppressive illusion of the past. The arrangement of the chapters here (not chronologically), together with the references to modern authors who are considered to have since more consistently achieved

ironic perception of the ontological order (or disorder) of things . . . Truth, identity, reality, and narrative dissolve in an indeterminacy that admits alternatives without reconciling them . . . An irony that transcends the boundaries of the artifact by continuing the cycle of self-creation and self-destruction in an unending succession.

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An engraving from C. R. Leslie's illustration to *Tristram Shandy*: "Uncle Toby and the Widow".

total textual irony, gives an impression of progress towards fulfilment of a philosophical ideal. Thus, Professor Furst begins with Jane Austen, in order to move beyond her. From this point of view, the best that can be said for her is that "the 'truths' on which [her] fictional world rests are questioned, at least to some extent", and that there is some "perception of the relativity of those 'truths' so confidently acclaimed", and so on. But then Jane Austen goes and endorses these selfsame truths, as though they did not exist only within literary quotation marks. Well, "maybe" (in words borrowed without a trace of irony from another critic) she "understood" deep down the alienation of *geist*. Next in line on the road to ironic realization stands Gustave Flaubert, who - amazingly - resembles her rather than any true textual ironist. His irony extended only to the vision of his characters, about which he was damningly certain, and not to his own. He did not "question the basic efficacy of language to convey meaning", and thus he avoids confronting . . . a more radically doubting and questioning irony of uncertainty."

This ideological interpretation of irony from the modernist end evaluates it ultimately in terms of its capacity for textual deconstruction. When translated into these ideological terms,

the effect of irony looks altogether too nihilistic, or would do if this kind of criticism did not seem so positively sure of its own superior ground. Artistically speaking, irony can often have a much more obviously enriching effect upon a statement or situation or text. Words can gain from it in immediacy and weight, their image of human experience becomes more poignant because it - and their - limitations are exposed. Irony does not lead away from reality into ideological reflection; it is precisely a manner of meaning without stating, an appeal beyond what is actually said to unspoken possibilities of understanding. The literal is not so much transcended as expanded by the presence of a new dimension within itself.

Into what realm of meaning an ironic style lifts language can be no more defined explicitly than other realms of poetic, imaginative, beautiful meaning can be. When words are used in such a way that they mean more than they say, and the world they mirror becomes other than it is, what is this but a form of literature, a condition of art? Irony is one form of imaginative realization, one of the ways in which experience comes to be appreciated more fully.

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Changing tack

A Genealogy of Modernism: a study of English literary doctrine 1908-1922
by Michael H. Levenson
Cambridge University Press, £22.50
ISBN 0 521 25010 2

Ill-named and ill-defined, "modernism" has for some time appeared *passé*. Now, as the fireworks of post-modernism and deconstruction fade, a book appears with something new to say about its formative period, the second decade of the twentieth century. Professor Levenson's lucidly argued, well-researched, and stylishly written book must be ranked as an important work on the century's most important literary movement.

Even enthusiasts for modernism have seen, or sensed, inconsistencies in its theory and practice. Professor Levenson's achievement is to clarify

and account for them. His close chronological study, year by year (in some cases even month by month) reveals that different species of modernism separated out early and then evolved before it was anti-individualistic, anti-traditional before it was traditional, inclined to anarchism before it was inclined to authoritarianism. The early modernists' desire for a decisive break with the past for immediacy, necessarily involved them in contradiction, for the past was not unitary, and immediacy could equally well be objective or subjective. So it is hardly surprising - though this has not previously been clearly mapped - to find

Professor Levenson sees 1914 as a key year, when divergent tendencies - egoist and abstractionist, realist and formalist - met. Add the inherent divergence of symbolism (tending to the transcendental) and imagism (to concrete particulars), and a highly unstable compound results. Whether this primal soup was more conducive to vital creativity than to muddle he

done with that folly . . . we artists who have been so long the despised are about to take over control. (Ezra Pound)

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does not attempt to decide. But he does see Eliot as something of a saviour, arriving rather late, like the US army, and with a similarly influential effect. Insisting on the importance of intelligence, and thus undermining "a series of formerly dominant concepts: sincerity, simplicity, freedom, expression, emotion", Eliot was able to reconcile the new with the old, modernism with tradition. A judgment tempering justice with mercy perhaps. Few, however, would quarrel with the conclusion: "Avant-garde movements always threaten to disappear . . . because within the avant-garde there inheres a permanent conflict: the need at once to subvert and to institutionalize. Without subversion a movement cannot justify itself; without some stability it cannot survive." Pound felt the one risk clearly: Eliot felt the other.

Alan Rodway

Alan Rodway was formerly reader in English at the University of Nottingham.



Fred Maddox Ford

BOOKS

Measure of respect

Report of the Committee of Inquiry into Human Fertilisation and Embryology
Chairman: Mary Warnock
Her Majesty's Stationery Office, £6.40
ISBN 0 10 193140 9

Our moral attitudes once had time to evolve to suit changing circumstances. Consider, for instance, how long it took for the financial needs of emerging capitalism to break down the medieval prohibition on usury. Such leisurely days are gone. Six years after the first birth to result from fertilization outside the body, we find ourselves pressed to make up our minds not only about the basic technique of *in vitro* fertilization itself, but also about the use of donated sperm, eggs and embryos; about surrogate motherhood; about the long-term storage of frozen embryos; and about the use of human embryos in research.

How is a democratic society to grapple with a technology which breaks into areas beyond our existing moral maps? In Britain, as in Australia and the United States, the first move has been to appoint a committee. These broadly-based committees may consist of social workers, lawyers, philosophers, theologians and representatives of diverse religious and cultural, as well as specialist, in the appropriate fields of medicine. The committee is asked to write a report, and to make recommendations to the government.

The Committee of Inquiry into Human Fertilisation and Embryology, chaired by Dame Mary Warnock, is an example of this means of tackling awkward problems, and its report gives us the opportunity to assess the wisdom of this approach. On the whole, the Warnock report scores well. It is written in a straightforward manner and should be comprehensible to people without specialist knowledge of the field. It gives substantially accurate summaries of the state of the art of the new forms of reproductive medicine. Most importantly, most of the recommendations it makes are defended by rational arguments — which is not to say that these arguments overlook the importance of ensuring that change comes at a pace which gives community feelings time to adjust.

The committee's recommendations have now received wide publicity, and it is scarcely necessary to summarize them. The media have focused on what the committee would and would not permit. Allowed are *in vitro* fertilization, embryo donation, embryo freezing and research on embryos up to 14 days old. Not to be allowed are the sale of human gametes or embryos, surrogate motherhood agencies, and research on human embryos older than 14 days.

Less prominent in the media reports, however, has been that recommendation which the report itself singles out as the most urgent of them all: the setting up of a new statutory authority, with substantial lay representation and a lay chairman, to regulate research and infertility services. If we overlook the importance placed on this recommendation, we may treat the committee's recommendations as if they were intended to be the last word on all these subjects. Instead of advice offered at this particular moment in the development of a constantly changing field.

In allowing *in vitro* fertilization, embryo donation and embryo freezing, the Warnock report is in agreement with the only other comparably detailed report to date presented by a government committee: the report of the Victorian Government committee of inquiry chaired by Professor Louis Waller. In reaching these conclusions, both the Warnock and the Waller committees have considered, and rejected, claims that these procedures should not be allowed because they are "unnatural" or an unwarranted intrusion of technology into marriage. The committees have, instead, been influenced by the very strong desires of many infertile couples, and have found it unreasonable to deny these couples what may be the only chance they have of bearing a child.

Following this line of reasoning, however, would lead to the acceptance of surrogate motherhood as well, since it too may be an infertile couple's only chance of having a child — for instance, when the woman has no uterus. One would think, therefore, that the Warnock committee would have needed very powerful reasons for its recommendation that such arrangements be prohibited.

Unfortunately this is one of the less satisfactory sections of the Warnock report. First, the specific recommendations made are odd. The report recommends legislation which would render criminal the actions of "professionals and others" who knowingly assist in the establishment of a surrogate pregnancy; but the report then goes on to say that it does not envisage that the recommended legislation would render criminal the actions of "private persons entering into surrogacy arrangements". In other words, if you can arrange your own surrogate pregnancy without the assistance of "professionals and others", you are free to go ahead — although the report does not enlighten us on how one might establish a pregnancy without assistance from another person. Does the male involved have to be ignorant about his role?

One might think that the committee is anxious to avoid the commercialization of surrogacy, and that its peculiar phrased recommendations are designed to prevent people from paying for surrogates, while leaving private, voluntary surrogacy untouched. This would be in keeping with the concern voiced in the report about the "exploitative" aspect of surrogacy when financial interests are involved. (Some

laissez-faire economists fail to see anything exploitative about free contractual arrangements of any sort, but the committee was obviously not sympathetic to such doctrines.) The puzzle is, however, that the committee explicitly recommends that "both profit and non-profit making organisations" should be prohibited. It is not easy to find, in the report, solid reasons for the prohibition of professionally arranged surrogate pregnancies in which money changes hands — and such altruistically motivated surrogates could undoubtedly help a small number of infertile couples to obtain the children they desire.

One other area in which the committee's reasoning is less rigorous than it might have been is in its speculations on the moral status of the embryo. The report says that "the embryo of the human species ought to have a special status and that no one should undertake research on human embryos for purposes of which could be achieved by the use of other animals". It adds that the status of the embryo is a matter of "fundamental principle" which should be enshrined in legislation.

One searches in vain for any indication, in the report, of the "fundamental principle" on which the committee bases its view that the human embryo needs protection. The committee does discuss those well-known views which claim that the embryo has the same status as a child or an adult — but the committee rejects that position which is, in my view, more soundly based: that the embryo cannot be thought of as a person, and that respect is due only to persons (I would

have preferred to say, only to sentient beings). But then the committee immediately goes on to say:

We found that the more generally held position, however, is that though the human embryo is entitled to some added measure of respect beyond that accorded to other animal subjects, that respect cannot be absolute, and may be weighed against the benefits arising from research.

This seems to be the position the committee embraces, but there is no further argument in its defence. Is the committee accepting this view merely because it is "more generally held"? Perhaps the position seems to be a nice middle-of-the-road one, between the extremes of right-to-life organizations and those who think it should be permissible to use early human embryos for any useful purpose at all. But is the latter position really so extreme? Those who are inclined to think that it is should ask whether they are prepared to advocate the prohibition of intra-uterine devices, which have now been shown to prevent pregnancy not by preventing fertilization, but by preventing the implantation of the embryo.

It might be thought that since the committee allows research on human embryos up to 14 days old — and even allows human embryos to be created specifically for research purposes — there is not much practical significance in the recommendation that the human embryo have a special status. But this would overlook the significance of the stipulation that the human embryo should not be used for research which "could be achieved by the use of other animals".

This stipulation is given added point by a section in a later chapter on the possible use of embryos for testing human embryos might be useful for testing the effects of newly developed drugs or other substances that may be toxic or may cause abnormalities, the committee goes on to say that the routine testing of drugs on human embryos is "not an acceptable area of research because this would require the manufacture of large numbers of embryos." Certainly, it would; but the committee must be aware that at present such testing is done on live, sentient animals, and that these animals are also "manufactured" or bred in large numbers. Where is the argument which says it is better to use developed animals, capable of feeling pain and of suffering from captivity in laboratory conditions, instead of using early human embryos which are unable to feel anything at all?

The Warnock report is, on the whole, a creditable attempt to sort out the complex moral issues thrown up by the new reproductive technology. If at some points there is a lack of argument for the conclusions reached, this shows merely that — as the committee itself would be the first to agree — any such report can only be a starting point for further thought.

Peter Singer

Peter Singer is professor of philosophy and Director of the Centre for Human Bioethics at Monash University, Victoria, Australia. His most recent book, co-authored with Deane Wells, is "The Reproduction Revolution" (Oxford University Press, 1984).

Meaning in maths

Children Reading Mathematics
edited by Hilary Shuard and
Andrew Rothery

John Murray, £7.50
ISBN 0 7195 4093 3

How Children Learn Mathematics:
a guide for parents and teachers
by Pamela Liebeck

Penguin, £2.95
ISBN 0 14 022529 3

Learning Mathematics:
the cognitive science approach
to mathematics education
by Robert B. Davis

Croom Helm, £22.50
ISBN 0 7099 0225 5

Resulting from the work of a group of teachers and teacher-educators, Shuard and Rothery's book is concerned with the problems that children encounter when faced with mathematical text. It contains many varied and valuable examples taken from published texts, and covers such topics as problems of vocabulary and syntax, "flow of meaning" (that is, ordering), and visual presentation.

Although there is a chapter on "readability formulae and their limitations", this is not surprisingly finds most work to date to be valueless when applied to mathematical text. What perturbs me is not so much the uselessness of such formulae, but that researchers can present indices such as "grade reading level" = 0.157X - 0.0496W + 3.6365 and "reading ease" = 206.835 - 0.8465 - 1.015W and still be taken seriously.

A chapter on research inspired by the project describes how two pieces of text were rewritten in a variety of forms and the results compared in classroom trials. As a result of this, and other experience, much valuable advice is offered to authors on how to make their mathematical writing more intelligible to students. Since anyone who constructs a worksheet, an example sheet or an examination paper is an author of some form of mathematical text, it follows that the book should prove of considerable help to most people involved in mathematics education.

Notwithstanding its considerable merits, however, I fear that there is a danger that the book will deflect teachers from major issues into relatively minor ones. The suggestions for future research do not impress me, for they seek only to add polish to the "surface" of the problem. The premise that "reading is getting the meaning from the page" is a suitable starting point for writing instructions for assembling a construction kit, or writing



A demonstration of "egocentrism", using a task designed to determine whether or not the child can understand that different people would see different views of this scene. The child is asked to indicate which picture is the one that the doll is seeing: "preoperational" children cannot take the perspective of another person. From the second edition of H. L. Bee and S. K. Mitchell's *The Developing Person*, published by Harper & Row at £12.95.

ing a three-pin plug; but it usually means in this book's context: "can the children follow the instructions and so carry out the task devised by the author?" Now this, of course, is extremely important and justifies the title of the book, but this type of "meaning" is not the one that should concern us most in mathematics. We want them to develop understanding and knowledge of angles.

"Meaning" in mathematics will not come from the printed page alone. Texts too have a variety of uses which instruction sheets do not: the forms they can take differ widely. Moreover, texts are for use in a classroom. In addition to the text and the tasks and activities to which it gives rise, the teacher and other pupils can cooperate to create and negotiate meaning. What is the role of the text in this total activity? To neglect such deeper issues in order to search further for readability formulae seems to me to misjudge both what is possible and, more importantly, what is desirable.

That children can carry out tasks with a protractor without any real understanding of the relevance of the numerals on it, is specifically pointed

out by Pamela Liebeck in her "guide for parents and teachers" on how primary-school children learn mathematics. This unpretentious and valuable book will no doubt become popular in teacher education.

The content is standard: the development of concepts of number and space, and the many suggestions for related activities are almost entirely the mathematical precision — for example, the carefully observed distinction between cardinal and ordinal numbers, the suppression of unnecessary symbolism, and the clarity of the writing. Liebeck assumes that "although the justification for spending so much school time on mathematics is that it is useful, its appeal for children is based on their intellectual or aesthetic response, in much the same way as the appeal of music or art". Although the validity of this might be debated with reference to other levels of education, I feel certain that in her context the thesis is valid.

Parents and teachers, however, have different concerns: the former concentrate their attention on individuals, their own children; the latter have classes to manage. Indeed, the book has little to say on problems of classroom management; and its obsolescence in the direction of theories of learning — the customary précis of Jean Piaget, Jerome Bruner, Richard Skemp and Zoltan Dienes — would seem insufficient as far as teachers are concerned. (It would also have been helpful if the Russian school stemming from Lev Vygotsky had been considered. The work of, say, A.N. Leont'ev and V.V. Davydov on activity is relevant to much British practice and deserves study.) As a result, the book is perhaps more successful in meeting the needs of parents than of teachers. Nevertheless, the latter will have much to gain from it.

Robert Davis reminds us that artificial intelligence is providing an important new framework within which to study cognitive psychology. His attempt to provide a deeper understanding of the thought processes involved in mathematical thinking draws heavily on two sources of inspiration. The first is the range of research into artificial intelligence and the writings of, for example, Herbert Simon, Marvin Minsky and Seymour Papert. The second is the longitudinal study in which Davis has participated for several years at the University of Illinois and based on the painstaking observations of students involved in mathematical activities. Davis uses the language and theories of the former to account for the findings of the latter.

This is an important book; but more for the possibilities that it opens up than for the conclusions that it reaches. However, although much of what is presented as "cognitive science" might seem to be applying new terms to describe old notions, this is not by any means the whole story. It is valuable, for example, to be forced to consider the ways in which knowledge is stored, retrieved and can be used; and clearly these will depend very much on how it is acquired — the process of learning.

The book then provides new insights and stimuli. At the moment the theory would not seem to make curriculum construction any easier, for it is essentially descriptive. Yet Davis indicates avenues for thought and research which could prove of considerable value and in the meantime provides the reader with many insightful analyses of students' mathematical activities. This is an unusual and rewarding book.

Geoffrey Howson

Professor Howson is Director of the Centre for Mathematics Education at the University of Southampton.

Keele Mathematical Education Publications have published an English translation (by F. R. Watson) of Arthur Engel's *Elementary Mathematics from an Algebraic Standpoint* at £20.00. (A short introduction for first-year undergraduates) at £1.00.

BOOKS

Laser analysis

Foundations of Laser Spectroscopy
by Stig Stenholm
Wiley, £35.00
ISBN 0 471 05999 4

The manner in which substances absorb and release electromagnetic energy at various frequencies has been a classical route to the understanding of the nature of matter. On this study, encompassed in the term spectroscopy, the laser has made a dramatic impact. Indeed, traditional spectroscopic techniques have been complemented or replaced steadily during the past two decades by new linear or non-linear laser methods.

The remarkable properties of laser light confer significant advantages. As well as being generally monochromatic and coherent, laser beams can be highly directional and intense, and

laser sources are now available which are tunable in frequency sometimes over a wide range, providing extreme spectral purity. Indeed, the range of wavelengths of laser sources is itself notable, extending from millimetre wavelength microwave sources to those having hard ultraviolet wavelengths of a few tens of nanometres.

Researchers developing new laser sources or laser techniques have generally had in mind that any new source in a new frequency range or having particular features would be of value to spectroscopists; and this has been one of the spur to the development of the present wide range of laser sources. The highly organized nature of laser radiation thus enables it to be used in a great variety of spectroscopic techniques to enhance resolution, sensitivity or time response.

To what spectroscopic use can the laser be put? Well, from the earliest laser with application in Raman spectroscopy to the attainment of linewidth resolutions of 10¹⁵ Hz and time-resolved spectroscopy with picosecond pulses, the achievements to date are impressive. The field of spectroscopy at high resolution has been vastly changed, spurred by the development of the tunable dye laser and, more

recently, by the tunable colour-centre laser and the semiconductor injection laser. Laser spectroscopy is presently a very active field, covering a wide range of physical phenomena that extend throughout the sciences and into many applications such as laser chemistry, laser isotope separation and multiphoton excitation of molecular systems.

This book has a definite aim: to provide the foundations of theory for further work in laser spectroscopy. This is one microcosm of the field, but an important one. The author has kept to his task, providing a theoretical framework and acting as a guide to interpretation for researchers new to the field. His approach is somewhat traditional, based on the use of non-relativistic quantum mechanics and classical electrodynamics, and he covers the theory of the subject at a level at which the majority of experimentation is practised — much along the lines set out by Lamb, adopting the semiclassical description as appropriate to spectroscopy. The book is therefore not at all comprehensive but follows the intention to develop the theoretical ideas needed for calculation in laser spectroscopy. Given this brief, it succeeds admirably.

The emphasis of the book is on atoms of simple level degeneracy. The behaviour of matter subjected to

radiation at one or more frequencies can be modelled on simplified energy level structures. To make full use of the very narrow linewidths capable of being obtained from laser sources, it is necessary to counter the broadening of spectral lines by the Doppler effect. Atoms or molecules moving towards an observer absorb or emit light at a higher frequency than atoms at rest and when moving away absorb or emit at lower frequency, causing a spread in the observed line and a loss of fine detail. Two techniques of working within the atomic Doppler linewidth are discussed: saturation spectroscopy and two-photon spectroscopy. Other topics covered include field fluctuations, an introduction to the elements of the quantization of the electromagnetic field, and the foundations of a theory of laser lines.

Although there are many active and important areas in laser spectroscopy which the reader will find in this book only by name, as a fundamental textbook it succeeds for use at the graduate level and will make rewarding reading for research workers new to the field.

T. A. King

T. A. King is senior lecturer in physics at the University of Manchester.



Martian landscape viewed from the Viking space probe, in the new paperback edition of Michael H. Carr's *The Surface of Mars* published by Yale University Press at £19.95.

Although Kepler, Galileo, Newton and their eighteenth, nineteenth and twentieth-century followers turned the full force of mathematics and physics on to our heavenly companions, they remained remote: we still had to make do with the electromagnetic waves they sent us and had to try our best to interpret these. All this changed, however, when we took four steps into space. Astronomically, the Sun had been demoted from its position at the centre of the only galaxy and was now found to be ignominiously tagged on to the edge of an arm of the Milky Way's spiral system — itself only one of a hundred thousand million other galaxies in the visible universe. More importantly, the combined invention of liquid fuel rockets, computers, radio and television had collected us to travel into space (1926 is selected by Hawkins as a significant date in the development of our ability to shoot rockets into space).

We can now walk on the Moon and send probes to the planets. And when our Sun turns into a red giant, which will eventually destroy all Earth's life forms, we will have the possibility of escaping to safety.

What next? Hawkins's mathematical progression predicts another step in the early twenty-first century. Step four has already set the limit on our universe to the redshift horizon 18 seconds (10¹⁰ light years) away. Although even in that immensity we still seem to be alone, perhaps step five will see us communicating with extraterrestrial beings.

Hawkins has written a most thought-provoking book. Although for my astronomical taste there is too much about the cosmos and too little about the mindsets, I would still strongly recommend it. Hawkins has not only given a fascinating résumé of our progress so far — he also encourages us to speculate about where we are going.

David Hughes

David Hughes is senior lecturer in astronomy and physics at the University of Sheffield.

Circle of ideas

Curves and Singularities
by J. W. Bruce and P. J. Giblin

Cambridge University Press,
£25.00 and £8.95
ISBN 0 521 29495 7 and 27091 X

In the early 1970s the French mathematician René Thom introduced a new circle of mathematical ideas, then dubbed catastrophe theory because of its ability to deal with sudden and discontinuous changes. Although some speculative applications of the theory provoked a harsh (and hasty) critical backlash, the ideas involved have since been developed to the point where they have substantial applications both within mathematics itself and in physics, chemistry, engineering and biology. For various reasons, the name singularity theory is currently more widely used; but the mathematics is essentially the same.

A singularity on a curve or surface is a point at which its behaviour is "strange": a sharp point (or cusp), a place where the curve crosses itself, or a corner. (There is of course a satisfactory technical definition.) The philosophy of the subject is that singularities are the places where the really interesting things happen, and that they organize what goes on nearby. For example, all but the most horrific singularities have a simple "normal form" if coordinates are correctly chosen; and the perturbations of a given singularity can be studied by means of a universal family of perturbations, known as an unfolding. Unfoldings have proved extremely powerful in applications.

This book seeks to introduce this important series of topics to final-year undergraduates and to graduate students in mathematics. Its authors have sensibly chosen to emphasize the theory's mathematical merits, by taking

some traditional topics in differential geometry and showing how singularity theory sheds new light. It is clearly written and beautifully illustrated.

The first few chapters develop the mathematical background: the real line begins in chapter five. If a smoothly varying family of curves is drawn, there will often be another curve to which they are all tangent: their "envelope". (Those artistic nailing-and-string pictures you can buy in craft shops exploit the beautiful geometry involved.) Classically, envelopes are defined in several ways: it is often concealed from students that these ways do not agree with each other. A singularity theory approach tidies up this mess, and adds some powerful results on the general nature of envelopes. For example, almost all envelopes are either smooth curves, or have at worst cusps in them.

The latest and most thoughtful ideas occur in the chapter on unfoldings, the authors picking their way through this difficult terrain with some skill. The applications include plane curves, space curves, the apparent contour of a surface, symmetry sets, evolutes, optical caustics, and differential equations.

The second major topic is transversality. Two curves are said to be transverse if they either fail to meet, or meet at a definite angle — not tangentially. Now generalize to higher dimensions. This concept has become absolutely fundamental in differential topology and is an extreme case of a simple idea with devastatingly powerful implications. The book would be worth reading for these sections alone.

Transversality is the key to understanding the "generic" properties of curves and surfaces: what is the "typical" behaviour, ignoring wild and unlikely (though still possible) pathologies? When does the typical actually happen? My sole criticism here is that the topic of moduli is introduced in a way which makes it seem to raise more serious problems than it actually does. A final chapter addresses the subject's origins — Thom's famous catastrophes — the authors summing up their views thus: "In its applications within geometry then, Catastrophe Theory has been and is being extremely successful. Having something new, and very relevant, to say about such a well-worked subject as the geometry of curves and surfaces is an accomplishment indeed. Surely such a brilliant circle of ideas deserves applause from all."

Ian Stewart

Ian Stewart is lecturer in mathematics at the University of Warwick.

A fourth edition of Hans Vehrenberg's *Atlas of Deep-Sky Splendours* has been published by Cambridge University Press at £25.00.

Paperback editions of three acclaimed books are available from Penguin: Harold Frisch's *Quarks: the stuff of matter* at £4.95 (see *The Times*, 16th March, 1984); H. R. Pagels's *The Cosmic Code: quantum physics as the language of nature* at £4.50 (see *The Times*, 25th March, 1983); and Graham Flegg's *Numbers: their history and meaning* at £4.95 (see *The Times*, 30th September, 1983).

Sentient limits

Man and Mouse: animals in medical research
by William Paton
Oxford University Press,
£9.95 and £2.95
ISBN 0 19 217734 6 and 286043 7

The literature concerning the use of animals in research is distinctly thin on the animal experimenters' position. In his short book, Sir William Paton seeks to redress the balance.

He gives a lucid account of the logic of "experimental medicine" and deals carefully with many of the criticisms of its opponents. For example, penicillin can kill guinea pigs. Indeed, it has been argued that had it been tested in this species it might never have been introduced to medicine. Sir William points out that the argument is incorrect historically; for this fact was known early on; and he goes on to explain how it might have alerted us to the allergic reactions which are one of the worst side-effects of penicillin in man and which we do share with guinea pigs. This example is characteristic of the way in which the author sees criticism as calling not for combat but for fuller explanation. He discusses toxicity tests more generally, and is encouraging to read that Sir William, himself a distinguished pharmacologist, believes that "there is scope for estimates of toxicity of less exactness... (and) hope of moving away from lethality as an objective in such tests".

The book deals carefully with moral as well as scientific issues. It is here that defences of research on animals by scientists are so often inadequate; but in *Man and Mouse* the moral issues are not shirked, or oversimplified, or assumed to be self-evident or beyond the reach of rational discussion. Sir William puts two boundaries across the natural world. The lower he puts between the vertebrates and the invertebrates, intending to divide conduct from sentient animals. The moral relevance of this criterion is clear: we use it within our own species when we remove life support systems from somebody who is permanently comatose.

The upper boundary he puts between man and other animals. Here the criterion is "man's capacity to accumulate experience and his solution to the problems he has encountered, by means of the spoken and particularly the written word". However, the moral significance of this capacity is far from clear. For example, if, as some have argued, mentally handicapped humans lack this critical capacity, why are we not justified in using them in the same kind of experiments we might carry out on chimpanzees?

However, it would be a pity if *Man and Mouse* gave the impression that the aim of this argument was to reduce moral concern for the mentally handicapped: indeed, it was first put forward by J. B. S. Haldane in a preface to *The Biology of Mental Defect* by Lionel Penrose, whose contribution to the welfare of the mentally handicapped could hardly be overestimated. Rather, its aim is to challenge the use of a criterion to exclude other species from a moral principle, by showing that it would also exclude some humans in a way that we would find unacceptable. Although Sir William defends the mentally handicapped against use in experiments on the grounds that they may all have some capacity for personal interaction, this is not the capacity that marks his upper boundary. Indeed, here we have an entirely new criterion introduced ad hoc. And Sir William does not make it clear why we are justified in using it selectively on behalf of our own species, for chimpanzees also lead rich interpersonal lives.

If *Man and Mouse* does not resolve the moral problems raised by experimental work on animals, it does at least raise most of them in a way that does justice to the complexity of the issues. It may well do as much to improve the level of moral argument among those who experiment on animals as it does to improve the level of scientific knowledge among their critics.

R. F. Drewett

R. F. Drewett is lecturer in psychology at the University of Durham.

Basil Blackwell

Introduction to Economics

An Integrated Approach to Fundamental Principles
JOHN CRAVEN

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BOOKS

ECONOMICS

Textbook market expansion

Foundations of Economic Analysis by Paul A. Samuelson
Harvard University Press, £21.25 and £8.45
ISBN 0 674 31301 1 and 31303 8
Economics (British edition) by David Begg, Stanley Fischer and Rudiger Dornbusch
McGraw-Hill, £9.95
ISBN 0 07 084146 2
Economics: An integrated approach by John Creedy *et al*
Prentice-Hall, £10.95
ISBN 0 13 224189 7

It was Alfred Marshall's view that "a good mathematical theorem dealing with economic hypotheses was very unlikely to be good economics". In a similar vein J. M. Keynes subscribed to the view that mathematical economics too easily allows an author to "lose sight of the complexities and interdependencies of the real world in a maze of pretentious and unhelpful symbols". Both men chose not to make extensive use of mathematics as a language in their economic analysis. This was in sharp contrast to the prediction made by W. S. Jevons that "economy, if it is to be a science at all, must be a mathematical science". However, it was Marshall's methodology which held sway from 1890 until the late 1930s.

The postwar period has seen the triumph of mathematical economics within the academic profession. The majority of Nobel prizes in economics have been awarded to those economists who have contributed to this development. At the forefront of this revolution has been Paul Samuelson who received the Nobel prize in 1970 for his contributions to "raising the level of analysis in economic science". Samuelson's intellectual inspiration came from the early piecemeal applications of mathematics to economics made by Antoine Cournot, Stanley Jevons, Léon Walras and others in the nineteenth century. In his view Marshall had succeeded with his ambiguities in "paralysing the best brains in the Anglo-Saxon branch of our professions for three decades". Thus as a graduate student at Harvard in the 1930s he was translating orthodox neoclassical and Keynesian economics into rigorous mathematical form earning him the title of "enfant terrible Emeritus".

Samuelson's magnum opus *Foundations of Economic Analysis* was first published in 1947 although it had been conceived and written in 1937 and eventually submitted as a doctoral dissertation in 1941. Samuelson is eternally grateful for "having been

born an economist before 1936". Not only was he able to experience the initial impact of Keynes's General Theory, but also, such was the imperfect state of economic theory, research was "like fishing in a virgin lake: a whopper at every cast". *Foundations* has inspired a whole generation of mathematical economists and along with his subsequent work has rightly earned Samuelson the reputation as one of the greatest economic theorists of all time.

Foundations of course is not an introductory textbook as the title might suggest but a classic in the development of mathematical economics. It contains many theorems which have served as a basis for empirical testing by others. This enlarged edition contains a new introduction portraying the genesis of the book. The original text is reproduced in full but has been supplemented by a mathematical appendix (144 pages) which takes account of some post-1947 developments in analytical economics, including linear programming, probabilistic choice, general portfolio analysis, mean variance approximations, and input-output systems. These developments directly relate to the material contained in the original work.

Although *Foundations* established Samuelson's reputation among his fellow economists it was his introductory textbook, *Economics*, first published in 1948, which brought the ideas contained in the Keynesian revolution to the wider public. To a large extent Samuelson's *Economics* and Richard Lipsey's *Positive Economics* have dominated the introductory textbook market during the past twenty years. The publication of David Begg *et al*, *Economics: An integrated approach*, has made the undergraduate textbook market truly competitive.

David Begg has substantially revised the original US edition produced by Stanley Fischer and Rudiger Dornbusch. This new textbook is designed specifically to meet the needs of British overseas students. The book is aimed at the A level and first-year undergraduate market and the non-mathematical style and presentation to economics for both specialist and non-specialist students. The authors have sought to provide a textbook which shows that "economics is a live subject offering powerful insights about the world in which we live". To this end an interesting blend of theory applications and data. Indeed the authors have taken great care to relate economic theory to problems that face people today.

The many topical applications in the microeconomics section include discussions of human capital theory, discrimination, competition policy, urban problems, coping with risk in economic life, the efficient market hypothesis, and the economics of nationalization. The chapter introducing welfare economics is remarkable for its clarity with Begg making use of statements from the manifestos of the Labour and Conservative parties as a starting point for an informative discussion of allocative efficiency, equity, market failure and the questions of government expenditure and taxation. The macroeconomics section is also

thoroughly up to date, with discussions of implicit contracts, aggregate supply, exchange rate determination and the effects of sluggish wage and price adjustment to aggregate demand and supply shocks. Four broad schools of thought in macroeconomics are distinguished: new classical, gradualist, monetarist, eclectic Keynesian, and extreme Keynesian. Getting off the fence the authors place themselves in the eclectic Keynesians' group. They believe that active stabilization policy is still worth undertaking to iron out the short-run fluctuations which result from short-run wage and price inflexibility.

The structure, though not the content, of the Begg volume is fairly orthodox. In contrast, John Creedy has produced a book with innovative structure, avoiding the traditional distinction between microeconomics and macroeconomics. Instead Creedy and his Durham colleagues prefer to categorize economic analysis according to the extent "to which interdependence in the economy is explicitly taken into account". The important distinction made here is between partial and general equilibrium analysis and the emphasis throughout the book is on the interdependencies which exist within any economy although the material is related to the UK economic system. Not much time is spent reviewing demand and supply analysis (typical of most orthodox textbooks). Instead the reader is very quickly launched into the highly topical issues of market versus government failure. The sections on economic efficiency, equity and social choice provide the necessary background for the interesting, and fairly extensive, discussion of government performance.

Much space is devoted in this volume than is typical to the analysis of the labour market and the issue of inequality. A full discussion of the economics of trade unions, human capital, discrimination and internal labour markets is included as well as up-to-date survey of government policy towards inequality in the UK. The Keynesian income expenditure model is treated as a "special case" where quantity adjustments predominate over price adjustments in the short run. This method of adjustment to disequilibrium is presented as one of many possibilities, although it was the one which had such an influence on postwar policy-makers. Samuelson's popularization of Keynes's model have contributed to the narrow approach typical of the traditional textbook of the 1950s and 1960s.

John Creedy's book is suitable for the specialist economics undergraduate and abounds in material useful for teaching purposes. However, I feel that the non-specialist student may find considerable sections of the book tough going. While Samuelson's *Foundations* remains a collector's item the books by Begg and Creedy will soon be finding their way onto many reading lists if they have not already done so. Economists usually favour competition. I wonder if this remains the case for authors of bestselling textbooks?

Brian Snowdon

Brian Snowdon is principal lecturer in economics at the Newcastle upon Tyne Polytechnic.

a level of almost 13 per cent in the US it has fallen sharply from over 10 per cent a year ago to its present level of just over 7 per cent. It is debatable therefore that unemployment remains the most chronic economic problem facing the US as the authors contend in their introduction. Be that as it may, this fall is due to the implementation in the US of precisely the Keynesian demand management policies the authors advocate. They arrive at these policies after a thorough evaluation of the alternatives, but I found much to disagree with en route.

Principally their analysis fails on the one hand to emphasize the role of real wage flexibility in increasing employment in the US; and on the other to point out that the relatively inflexible structure of real wages set above the market clearing level is a major cause of unemployment in Britain. Also I must disagree with the classification of demand deficient unemployment of all unemployment in excess of the level of vacancies.

The main strengths of the book lie in chapters seven, eight and nine which discuss the dimensions of unemployment in the two countries, the causes and incidence of high unemployment, among US blacks, and the private and social costs of unemployment. The

first of these three chapters reveals that the problem of long-term unemployment is much more serious in Britain than in the US and that in Britain the typical spell of unemployment increased steadily throughout the 1960s and 1970s until it now stands at almost 90 weeks. In contrast in the US over this same period it showed no increase, remaining at about one third the British level. Is this yet further proof of the relative inflexibility of the British labour market and have we thought through the full implications of this frightening development? The authors detail several reasons why we should view this with increasing concern and yet policy-makers seem oblivious to appeals for special help for the long-term unemployed.

Although a few will agree with all that they find in the book, most will emerge wiser and I hope more convinced that unemployment is the most chronic economic problem facing Britain today.

R. F. Elliott

R. F. Elliott is senior lecturer in political economy at the University of Aberdeen.

BOOKS

ECONOMICS

The view from Italy

The Making of Keynes's General Theory by R. F. Kahn
Cambridge University Press, £20.00
ISBN 0 521 25373 X
Keynes: the instability of capitalism by Fausto Vicarelli
Macmillan, £25.00
ISBN 0 333 38276 5

While the seeds of the Keynesian revolution were being planted in Cambridge, some of them were given to Piero Sraffa and thus they found their way to Italy, where they flourished. The Banca Commerciale Italiana and the Luigi Bocconi University joined to invite Lord Kahn to lecture on the origins of the *General Theory* and Cambridge University Press has published the results for the Raffaele Mattioli Foundation; Fausto Vicarelli is at the University of Rome.

The two books have a similar aim: to place Keynes's work in its intellectual and historical context, but they approach their subject in very different ways. Lord Kahn has concentrated on the *General Theory* as the culmination of Keynes's theoretical quest. He has both followed his hosts' request to trace the immediate and personal

No single system

The Collected Papers of Kenneth J. Arrow
volume one: Social Choice and Justice
Blackwell, £25.00
ISBN 0 631 13339 9

Naturally, Arrow's famous impossibility theorem provides the main theme for this volume. The definitive statement of the theorem is not here, since that is a book in its own right (*Social Choice and Individual Values*, 1951). What we have is a series of papers, written over a span of more than 25 years, presenting the theorem informally in various ways and discussing its significance. The first of these is preceded by a fascinating note in which Arrow describes how he came to produce his theorem. At the time, he explains, he saw the theorem as an interesting but self-indulgent deviation from real economic research; he still seems surprised that this sideline of his should have prompted the revival of a branch of knowledge that had been moribund since the eighteenth century.

Inevitably there is a certain amount of repetition in these successive presentations of the impossibility theorem, but it is illuminating to trace the development of Arrow's thought. The essence of the theorem is that there can be no satisfactory procedure for amalgamating the preferences of individuals into a single system of social preference. Many people have argued that Arrow's conditions for a satisfactory procedure are too strict in that they do not allow interpersonal comparisons of welfare to count as data. Arrow has taken this criticism seriously, and wrestles with it in several papers. Nevertheless, he remains deeply suspicious of interpersonal comparisons for "reasons" which, as he admits, he has difficulty in articulating. At the heart of his suspicion, it seems, is the sense that the autonomy of individuals is connected with the incommensurability of their experiences.

This theme is taken up again in *Theory of Justice*, Rawls's work, says Arrow, is based on the hypothesis that there is a universal concept of justice that all individuals can discover by arguing themselves back into an "ori-



J.M. Keynes

influences on Keynes's thought and reached back to the founders of the subject in discussing Say's Law and the quantity theory of money. Lord Kahn's chronicle of Keynes's "long struggle to escape" from these two key ideas provides the continuity in a book whose rich and wide-ranging content is not always easy to follow.

In addition to the thorough discussion of the history of the two central ideas, the influence of D. H. Robertson, A. C. Pigou and Piero Sraffa is fully treated in the first lectures. Then there is a lecture on the *Treatise* and contemporaneous policy issues and one on the multiplier before drawing the threads together in the fifth lecture, on the *General Theory*. The sixth lecture paints a portrait of Keynes as a professional colleague to the author, Robertson, Pigou and Lionel Robbins.

As the book moves between the history of ideas and the personal and often anecdotal, many ideas remain in outline; one often wishes that a line of thought had been continued further. (Investment and finance and the escape from the quantity theory are the most fully treated topics.) Listening to the original lectures, more wide-ranging even than the book, must have been taxing, albeit fascinating. Perhaps this accounts for the uneven quality of the discussion, which together with Lord Kahn's reply accounts for fifty pages.

Professor Vicarelli establishes a unity and coherence in Keynes's work in a

most original way. He has taken all Keynes's major works from *Indian Currency and Finance* to the *General Theory* and treated them on an equal footing, each as an example of the impact of Keynes's experience of real-world economic problems on the evolution of Keynes the theorist.

The book is a complex web of interacting ideas and some of the links are startling. For example, Keynes's India Office experience feeds through not only to his views on the interwar gold standard and on postwar monetary reform, but there are also connections with theory—India as an international sink for purchasing power in her hoarding of gold is a precursor of liquidity preference—and even with method: Vicarelli links Keynes's "bootstrap" theory of interest rates to the early recognition that financial institutions determine the general level of interest rates in a manner too difficult to model and best taken as given.

My major criticism concerns Professor Vicarelli's treatment of Alfred Marshall. He sees him as no exception to those neoclassical economists who have "shaken off any reference to the specific historical and institutional characteristics of the economic system which was meant to be the object of the analysis". Lord Kahn's Marshall, a close student of industry, trade and finance, is the Marshall I think Keynes would recognize. Lord Kahn does not discuss Marshall's method, but the case can be made that Keynes's ability to capture aspects of a dynamic system in a static formulation, the very method that Professor Vicarelli approves in Keynes's interest theory, was learned from Marshall.

Naturally there are points of disagreement between the two books. Perhaps their differing perspectives on the body of material which has achieved common currency but remains beyond most intermediate microeconomic texts, would be the most interesting to resolve.

Victoria Chick

Victoria Chick is reader in political economy at University College London.

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Allen & Unwin, £16.00 and £6.95
ISBN 004 330339 0 and 330340 4

After Stagflation: alternatives to
economic decline
edited by John Cornwall
Blackwell, £19.50
ISBN 085320 545 8

The Barbaric Counter-Revolution:
cause and cure
by W. W. Rostow
Macmillan, £17.50 and £7.95
ISBN 0333 37341 and 37342 1

The intellectuals in this epoch taught definitely and dogmatically that if only men would buy and sell freely, lend or borrow freely, sweat or slack freely, in practice, steal or swindle freely, humanity would be happy. The Common Man soon found out how happy: in the slums where they left him and in the slump to which they led him.

Chesterton's verdict on the classical economists of the nineteenth century was perhaps unduly harsh, given the conditioning of their times: it is an astonishing and infinitely depressing fact, however, that in the view of many his judgment applies precisely to the intellectuals of the 1970s and 1980s whose influence gave respectability to economic policies pursued in both the United States and Britain with catastrophic consequences for the most vulnerable citizens of both countries.

These three books, in their different ways, provide a counterattack to the neoclassical monetarists and their policy achievements - which some would call the economics of the Somme. In Britain, the rate of inflation - public enemy number one to infinity in the monetarist eschatology - has been reduced to 5 per cent at appalling cost in terms of unemployment. If that is to be judged a victory in economic policy, say the authors involved in these books, then God preserve us from any more such victories. Some counter-attack was surely overdue.

The volume edited by Edward Nell consists of 12 papers of predominantly

North American origin: the only British participant is Geoffrey Hodgson of Newcastle Polytechnic who exposes what he believes to be the true nature of Thatcherism. The bulk of the essays set out to attack the intellectual foundations of neoclassicism. This is a relatively novel approach, since hitherto the retreating Keynesians have tended to be somewhat cowed by the apparent theoretical sophistication and rigour of the neoclassicals, concentrating instead on the grotesque unreality of their assumptions. This was always a hopeless strategy, because to this new generation of theorists realism and usefulness were not merely otiose but a positive nuisance since they tend to obtrude into the elegance of the mathematics. How else can one begin to comprehend assertions in learned journals by highly intelligent men that "the unemployed worker at any time can always find some job at once"? Economics is surely in a profoundly sick condition when its distinguished practitioners seriously assert that 19 million unemployed citizens in Europe are really only taking an extended holiday while they look around to discover how their careers may best be advanced.

The editor claims that the papers in this volume (and the reader should be warned that they are tough going), demonstrate that each of the three branches of "conservative" economic theory (supply-side economics, monetarist monetary theory and the rational expectations doctrine) are not merely based on totally unrealistic premises but are deeply and fundamentally flawed in their internal logic. That claim is doubtless over-optimistic if the book does something to shake the overweening arrogance of much of the monetarist episcopate the authors will have rendered a signal service to mankind in general and academic economics in particular.

The Cornwall volume, by contrast, will be much more accessible to the undergraduate student totally bewildered by the tower of Babel which passes for contemporary economics. It consists of six lectures given at Dalhousie University in 1982 plus contributions by the editor. The theme is policy rather than theory and the crucial question which each addresses is: what happens after the monetarist has been beaten back by the sheer torture of unemployment and rusting idle capacity, what happens if and when some modest degree of recovery occurs? Will the victim have to be put straight back on the rack again, so that, as Professor Rostow puts it, we are doomed to controlling inflation by the preservation of a Marxist reserve army of unemployed?

The "mainstream" Keynesians in

this symposium, like James Tobin and Richard Lipsey, are mildly optimistic, arguing that a modest rate of growth can be combined with reasonably stable prices through the implementation of an effective incomes policy - in particular a tax-based system in which employers disregarding the general norms would incur suitable tax penalties. One would like to believe them but on this side of the Atlantic, at any rate, it sounds very much like Dr Johnson's dictum on the remaining widower: the triumph of hope over experience. The neo-Keynesians like Wynne Godley and John Cornwall himself, on the other hand, are much more pessimistic, arguing that the combination of growth and price stability is unattainable without quite far-reaching changes in our political structures. "Inflation", says John Cornwall echoing a now notorious battle-hymn, "is always and everywhere a political phenomenon." And his sombre concluding lines are "It is hard to be anything but pessimistic about the alternatives to economic decline. For the time being, there seem to be none." Well, at least he is faithfully upholding the tradition of economics as the dismal science.

Professor Walt Rostow, on the other hand, is distinctly optimistic at least as far as concerns the United States, the main subject matter of his book. As befits so distinguished a historian, he views our present distress against the broadest of backdrops, arguing that we are confronted with the fourth industrial revolution and have slipped off (he hopes temporarily) the upswing of the fifth Kondratieff cycle. Spelling out what he calls "a civilized synthesis", he argues that growth and price stability can be reconciled - principally through an incomes policy based on firm presidential leadership and a social consensus. The idea may appear radical (and therefore hopeful) to an American audience, but for those of us in Britain who have grown old and grey and full of sleep to the sound of disintegrating social contracts we are back with Dr Johnson.

In a long introduction discussing the British case, Professor Rostow, not surprisingly, is more cautious on the prospects of an effective incomes policy. Even so - more I suspect from politeness than real conviction - he concludes that if I were to bet, I would lay my money on the proposition that British society will find way to a new consensus. There speaks, unless I am gravely mistaken, a strictly non-belline man.

E. T. Nevin

E. T. Nevin is professor of economics at University College, Swansea.

Austrian beliefs

The Capitalist Alternative: an
introduction to Neo-Austrian
economics
by Alexander H. Shand
Wheatshaf, £16.95 and £6.95
ISBN 07108 0231 5 and 0262 5

Money, Capital and Fluctuations: early
essays
by F. A. Hayek
Routledge & Kegan Paul, £12.50
ISBN 07100 9921 5

Despite the notorious and well-publicised disagreements among economists, much of what is taught and published in textbooks is common core material. This is "positive economics" which attempts to analyse economic behaviour using methods of analysis familiar to any natural scientist. The division between the Austrian economists (and, indeed Marxists) and positive orthodoxy begins at the level of method and its underlying philosophy. "Subjectivism", the heart of Austrian methodology, is the view that individuals are in possession of information which can be known only to those individuals and not, for example, to an observing economist. "Praxeology", the study of human action, derives from the axiom that individuals act purposefully - to attempt to achieve chosen ends. The study of economic activity, then, should be underpinned by a conscious awareness of individuals acting purposefully, of information privy to those individuals. The paradigm, "methodological individualism", is a direct contrast to the holistic approach of macroeconomics

which seeks to describe behaviour in terms of aggregates. Heterogeneity and incompleteness of factual knowledge lead to the Austrian fascination with the unintended consequences of purposeful actions: markets, money, common law can be viewed as institutions evolving as unintended consequences of the activities of millions of individuals, by-products of the free activity of individuals which also protect the spontaneous order that perpetuates individual liberty.

Alexander Shand's book is a guide to the Austrian analysis of economic phenomena and to the methodology and philosophy which are never far below the surface features of the analysis. There are 16 concise expository chapters and a conclusion. Broadly, Austrians contend that economic efficiency is only achievable through free market activity; the market coordinates individual activity and competition provides the discipline necessary to minimize market power and preserve individual liberty. The role of the state should be diminished, though to what extent is an issue over which Austrians themselves differ, views ranging from the anarcho-libertarianism of Murray Rothbard to the, by Austrian standards, liberalism of F. A. Hayek, the leading Austrian. All Austrians would agree, however, on the necessity for governments to withdraw their fingers from the market to place. Subjectivism implies, it is argued, that there is no objective information available to economists or bureaucrats (because it does not exist) upon which intervention can be justified or upon which state controlled business can be run. Further, agents of the state, however well-intentioned, will necessarily have objectives and motives different from those which promote economic efficiency. Central planning and socialist calculation are, of course, abhorrent.

Although there are works on Hayek and various collections of readings, this book is probably the first comprehensive exposition of Austrian economics. It is clearly written, provides a fair summary of the Austrian position and is accessible to anyone with a grounding in orthodox economics. Despite the title it is not really until late in the book that the author's own adherence to Austrian ideas begins to stand out. Criticisms are reviewed, often brought in as straw men but not always knocked down. The reader may feel that logic is occasionally left hanging and may feel stimulated to consult source material. Austrian economics is a rich field and, subjectivism might suggest, likely to be mined selectively. Those of socialist persuasion will find the ideas anathema to their interpretation of the world; many liberals, especially those employed by the state, may find them offensive and threatening. However, those interested in the intellectual foundations of the radical new right will find this book an invaluable companion.

The living link between Austrians, largely eclipsed by Keynes in the late 1930s, and today's neo-Austrians, is the recently-knighted Nobel prizewinner, F. A. Hayek. The collection of early essays by Hayek are surprisingly the first translations from the German, and include the 1928 "Interpretation of the Value of Money". The essays show something of the background to the famous and controversial "Prices and Production" and will be welcomed by scholars to whom they were previously inaccessible.

J. R. Slater

J. R. Slater is lecturer in industrial economics at the University of Birmingham.

BOOKS

ECONOMICS

Policy targets

The Making of Economic Policy:
theory and evidence from Britain and
the US since 1945
by Paul Mosley
Wheatsheaf, £18.95 and £6.95
ISBN 07180 0144 0 and 0215 3

The history of macroeconomic policy in the United Kingdom and United States provides a wonderfully rich source of material for a variety of studies of policy-making. But the aim of this book is limited to an investigation of "whether it is possible to explain the macroeconomic policy actions of governments in any systematic way".

The author reports his various attempts to use basic statistical techniques of regression analysis to find relationships between policy "instruments" and a range of "target" variables. The framework of analysis is one in which the state of the economy, defined in terms of the target variables, affects government popularity (as measured by Gallup). On the assumption that governments manipulate policy in an attempt to stay in power, there is a set of "reaction functions" which describe the relationships between the policy instruments and the target variables. A main argument is that, far from attempting to maximize anything, governments pursue a policy of "satisficing". Thus, so long as each target variable does not exceed some threshold level, beyond which the resulting "crisis" is expected to lose the government too many votes, a simple "rule of thumb" policy is continued.

This view of economic policy has, perhaps, a superficial appeal. The problem is that it is much too simple as it stands, and adding empirical content presents formidable difficulties. The identification of policy "instruments" and "targets" is far from straightforward, as is the specification of the threshold level in the satisficing model; all this is further complicated by the changing international environment and structure of the economy. The author first reports a number of unsatisfactory regression results which attempt to explain government popu-

larity (the lead in the polls of the government party over the principal opposition party) in terms of real disposable income, the deviation of unemployment and inflation from trend, and the times since the last, and to the nearest, election. He concludes that the estimates, "could not be adopted as a guide by a governing party wishing to manipulate the economy so as to maximize the level of its support". Following a brief discussion of the role of newspapers in influencing public opinion, it is nevertheless argued that governments will follow the "rule of thumb" of stimulating the economy just before a general election.

A large proportion of the book is taken up with the estimation of government reaction functions. The instruments of government policy considered (the dependent variables in the regression analyses) are Budget tax changes (the change in total tax revenue), changes in public investment, and the level of bank rate. No interdependencies are examined, and exchange rates are ignored on the peculiar argument that they are "primarily international". The targets used vary among regressions but include unemployment, the balance of payments, inflation and monetary growth. Most readers would be surprised by the choice of interest rates as an instrument for recent years. In most cases a "dummy" variable is included, which is set equal to one (unity) during the year preceding an election, and is otherwise zero. The "satisficing" idea is specified by measuring each target variable as a deviation from its value over the previous three years. In the final set of results each target is set equal to zero when it is below its recent average, and when the author judges that it was not relevant. For example, unemployment is only non-zero when it is above its

previous average in the years 1960 to 1979. The corresponding period for inflation is, rather strangely, set between 1971 and 1976. (The reader should be warned that the author confusingly states that the *instrument* is set equal to zero in such times.)

The choice of instruments and targets is of course open to criticism; it is doubted that simple linear specifications could capture such complex and changing processes; and the use of positive deviations from recent trends is a crude way of specifying satisficing behaviour. Unfortunately, the author does not seem to appreciate that the vast majority of the statistical results are worthless. A bad argument is provided by the glossary which defines regression as "an econometric technique used to estimate coefficients", and estimation as, "calculating on the basis of statistical evidence the effect of variables on each other". Taken at face value, the results are statistically weak. But the Durbin-Watson statistics (never mentioned) show that in virtually every case there is significant first order serial correlation in the residuals. As a result, the calculated "t-values" are entirely unreliable.

The reaction functions are finally inserted into a small Keynesian macroeconomic model, chosen because it could be presented in a flow chart, which is then never discussed. The author argues that forecasting accuracy is improved and that governments have performed better than some critics have suggested. It seems most unfortunate that such an important and lively subject has been treated in this way.

John Creedy

John Creedy is professor of economics at the University of Durham.

Factor flows

The Economics of International
Integration (second edition)
by Peter Robson
Allen & Unwin, £6.95
ISBN 004 338113 8

The main message of this substantially revised book is that a theory of international economic integration should be concerned with the mobility of factors as well as with the flow of goods. The theory here propounded is neoclassical; there are two countries, two goods and all the other standard assumptions of this approach. The result is comparative statics, and it is

from this that the author tries to free himself.

Historically, the first steps towards integration and integration theory were tariff reductions and customs union theory. Some neoclassicists then enshrined the theory in models with straight line demand and supply curves which helped to explain the first stages of integration in the 1950s. It remains arguable whether the absence of generally accepted further theoretical guidelines has restrained integration or moves towards more integration or vice versa. Be this as it may, Peter Robson argues that even an ideal customs union would fall short of being a common market, unless and until there is a free flow of factors as well as of goods. But there is no empirical proof. Some econometric work on the EEC shows that trade creation has exceeded trade diversion and that there have been favourable income effects, but the question of whether the EEC has become a common market cannot be proved econometrically. So we must return to theory.

The core of Robson's argument is that trade alone will not reduce disparities in factor earnings. Non-tariff barriers too must be dismantled, including impediments to capital movements. He draws attention to the possibility of transnational enterprises emerging as the chief beneficiaries and to the regional and social issues involved, but does not fully relate this to an earlier chapter on monetary integration. Had he done so, it would become clearer that the transnationals have solved, or overcome, the problem of capital integration through recourse to Eurocurrency markets. There is no problem of capital flows for such enterprises, but there remains one for the others. The question is how to spread the benefits of integration.

While this book takes us some steps closer to an understanding of how this might be done, it does not get us all the way, possibly because of insufficient "integration" of other arguments found in various chapters. For instance, much play is made in various sections of the book, of increasing returns to scale. Now relate this to the argument that a wider market may lead to lower prices and higher profits. Both results may follow from tariff reductions. But in the case of technological-intensive manufacturing, the lower price is not due to tariff reductions which help rather to raise (because untaxed) profits. It is due to scale economies which are no longer taxed away. These points warrant further integration into a more complete theory. This said, Robson brings us closer to such a theory than most have so far.

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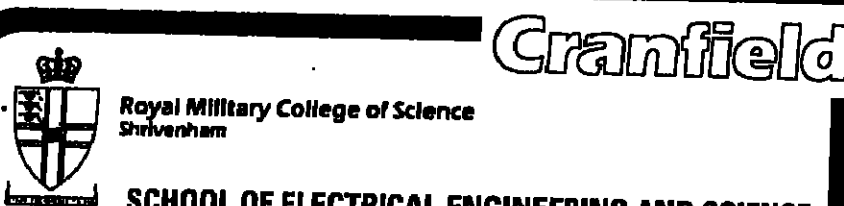
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pate in research in association with other the Satellite and Telecommunications
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2. Lecturer in Telecommunications/Satellite/Information Systems:
The successful candidate will join a rapidly expanding research group comprising
both academic and contract research staff and students. The appointee will be ex-
pected to support and extend research as well as make contributions to teaching,
especially on a new postgraduate course in Satellite Communications starting in
October 1984. (Ref: 319/THES)

3. Lecturer in Control Engineering
Candidates should have research and/or development experience in linear or
digital control systems, and be able to teach it at final year undergraduate and at
master levels. A knowledge of general electronic circuits and systems would be
advantageous. The appointee will be expected to undertake research in control
engineering and contribute to organisational activities and curriculum develop-
ment within the Department. (Ref: 320/THES)

4. Lecturer in VLSI Design
Candidates should have research and/or development experience related to the
use of computer aided design methods for VLSI circuits. A sound knowledge of
general electronics and computer systems would be advantageous. The ap-
pointee will be expected to contribute to research and teaching programmes in
micro-electronics and information systems and to take part in organisational ac-
tivities and curriculum development within the Department. (Ref: 321/THES)

Salary will be in the range £7,190-£14,125 (under review) per annum, depending
on age and qualifications, with superannuation under U.S.S. conditions.
Further particulars of these posts may be obtained from the Academic Registrar
(AR), University of Surrey, Guildford, Surrey GU2 8XH, or telephone Guildford
071251, Extension 633. Applications in the form of a curriculum vitae, together
with the names and addresses of three referees, should be sent to the above by
Friday 2nd November, 1984, quoting the appropriate reference. (10820)

UNIVERSITY OF ULSTER Faculty of Social and Health Sciences

LECTURESHIP IN PHYSIOTHERAPY

Ref 076 (Jordanstown)

Salary Scale: £7,190-£14,125 (under review)

Commencing salary will be determined by qualifications and
experience.

Applicants must be fully qualified physiotherapists eligible
for state registration. They should also show evidence of
post-qualification personal development, as evinced through a
degree, teaching qualification, research interests, or publica-
tions.

The person appointed will be required to teach on the four
year full-time Honours degree course in Physiotherapy,
based on the Jordanstown campus. They may also be re-
quired to contribute to the certificate course in Advanced
Physiotherapy Studies, and other post-registration and post-
graduate activities sponsored by the Department of Occu-
pational Therapy and Physiotherapy.

Applicants should indicate clearly the location of the post for
which they are applying.

Further details are available from the Staffing Officer De-
signate, University of Ulster, PO Box 35, Coleraine, Co Lond-
onderry BT52 1SA, (Telephone: Coleraine 4141, Ext 568), to
whom applications including a full curriculum vitae and the
names and addresses of three referees should be sent not
later than 22nd October, 1984.

Further details are available from the Staffing Officer De-
signate, University of Ulster, PO Box 35, Coleraine, Co Lond-
onderry BT52 1SA, (Telephone: Coleraine 4141, Ext 568), to
whom applications including a full curriculum vitae and the
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Southampton THE UNIVERSITY

DEPARTMENT OF COMPUTER STUDIES (Re-advertisement)

Applications are invited for the post of LECTURER in Computer
Studies. We are a small group
with a strong research interest in the application of computers to
modern computer science in
novel application areas, and we
are looking for a like-minded
person to strengthen research
activity in this field, and to
contribute to a thriving
undergraduate teaching
program.

Candidates should have an
Honours degree in Science,
Engineering or Mathematics and
either a higher degree (in
Computer Science for preference)
or appropriate industrial
experience.

We recognise that good
Computer Scientists come from
diverse backgrounds, and we are
therefore prepared to be broad-
minded when assessing the
relevance of qualifications and
experience. In particular,
applications from young
researchers of demonstrable
promise will be welcomed.

The post is tenable immediately.
Salary scale £7,190 - £14,125
(under review). Initial salary will depend
on qualifications and experience.

Further particulars may be
obtained from Mrs E.C.P. Sears,
Staffing Department, The
University, Southampton SO9
5NH to whom applications (7
copies from United Kingdom
applicants) should be sent not
later than 31 October 1984
quoting reference 1718/A.

Further particulars may be
obtained from Mrs E.C.P. Sears,
Staffing Department, The
University, Southampton SO9
5NH to whom applications (7
copies from United Kingdom
applicants) should be sent not
later than 31 October 1984
quoting reference 1718/A.

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Staffing Department, The
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Further particulars may be

Colleges and Institutes of Technology continued

North East Surrey College of Technology
Reigate Road, Ewell,
Epsom, Surrey KT17 3DS
Surrey
Education Committee

Applications are invited for the following posts to be filled as soon as possible:

SENIOR LECTURER IN COMPUTING

(Re-advertisement)
Consideration will be given to applications with previous HND/OND experience.

Salary Scale: Senior Lecturer £21,175 - £24,061 p.a. plus £258 p.a. London Fringe Allowance. Generous pension scheme in approved cases.

Please send a stamped addressed envelope for further particulars and application form from the Principal (SS106).

Examiners

The Royal Society of Arts Examinations Board
Certificate for Vocational Preparation Tutors
APPOINTMENT OF ASSESSORS

Applications are invited from experienced staff to act as assessors to the provision network of centres providing the above certificate. Assessors should have experience of operating vocational preparation programmes and/or contributing to staff development within a vocational education.

Further details and an application form may be obtained from: Chief Examiners, Royal Society of Arts Examinations Board, John Gwynne, 10, Bedford Square, London WC1N 3EU. Tel: 01-493 8555. Ext. 210. (SS109)

PLEASE MENTION THE T.H.E.S. WHEN REPLYING TO ADVERTISEMENTS

Derbyshire College of Higher Education

LECTURER GRADE II/ SENIOR LECTURER IN ELECTRICAL ENGINEERING

preferably in the area of electrical power.

The successful candidate will be expected to teach on honours degree and advanced technician courses, and participate in programme of research related to their teaching.

Salary in the range: Lecturer Grade II — £7,548-£12,099

Senior Lecturer — £11,175-£13,128-£14,061

Application forms and further particulars from the Staffing Officer, Derbyshire College of Higher Education, Kedleston Road, Derby DE3 1GB, telephone Derby 47181, extension 8, to whom completed forms should be returned by Friday, 19th October 1984. (10956)

INNS OF COURT SCHOOL OF LAW DEAN OF FACULTY

The Council of Legal Education will shortly appoint a Dean of Faculty of the Inns of Court School of Law to succeed Mr. Charles Morrison QC MA. The salary payable will be not less than £25,000. Those interested in the appointment are invited to write personally to the Chairman, The Council of Legal Education, 4 Gray's Inn Place, London WC1R 5DX who will be pleased to supply further information. (10951)

Luton College of Higher Education
Park Square, Luton, Beds

Department of Liberal & General Studies

Required 1st January 1985

LECTURER GRADE II IN EFL AND COMMUNICATIONS

A suitably qualified person is required to teach communication studies in the College. In addition to teaching at various levels in other Departments, the applicant would teach in the large amount of EFL work within the Department itself.

Experience in teaching RQA EFL Diplomas is essential. Details and Application Form from Assistant Director, Higher Education, Luton College, Luton LU1 3JG. Tel (0528) 3411 ext 800.

(Beds CC is an equal opportunity employer) RB

Derbyshire College of Higher Education
ADMINISTRATIVE OFFICER (ACADEMIC MATTERS)

Salary: POE £10,761 - £12,703 (under review). Applications for the post should be sent to the Staffing Officer, Higher Education, Derbyshire College of Higher Education, Kedleston Road, Derby DE3 1GB, telephone Derby 47181, extension 8, to whom completed forms should be returned by Friday, 19th October 1984. (10956)

Colleges of Further Education continued

Nene College Northampton

Director: E. Ogilvie, BSc (Econ), MEd, PhD, FRSA

Faculty of Art and Design

Full Time Senior Lecturer Course Leader for FOUNDATION STUDIES

Applications are invited from suitably qualified and experienced persons for the above post within the Faculty of Art and Design. Applicants should have a good honours degree and experience of teaching on a Foundation course. The preferred candidate may also be a specialist in a relevant area of Art and Design. Salary scale £11,175-£13,128 (Bar) - £14,061. (10971)

Full Time Lecturer Grade 1/2 in GRAPHIC DESIGN

Applications are required for the above post to help further develop the OATC Diploma course in Graphic Design in the Faculty of Art and Design. Duties will include teaching fundamental drawing and design skills, but applicants should also have a positive attitude to new technology and design methods. Industrial experience or specialist knowledge in related disciplines such as computer graphics, packaging, printing or photography may prove advantageous. Salary scale £9,091-£10,512 (L1), £7,548-£12,099 (L2). (10971)

Further details and application forms from the Dean of the Faculty of Art and Design, Nene College, St. George's Avenue, Northampton NN2 6JD. Telephone (0804) 714101.

Closing date for applications is 18th October 1984. (10971)

Avery Hill College
Bexley Road,
Ripham, SE29 2PQ
Tel: 01-850 0081

Inner London

Education Authority

PRINCIPAL LECTURER IN YOUTH AND COMMUNITY STUDIES

HEAD OF YOUTH AND COMMUNITY SECTION

Required from January 1985. An early or as soon as possible start is essential. The successful candidate will be expected to lead a team of staff in the delivery of youth and community studies. The post involves a high level of responsibility and requires a person with a strong commitment to the development of youth and community studies within the college. The successful candidate will be expected to lead a team of staff in the delivery of youth and community studies. The post involves a high level of responsibility and requires a person with a strong commitment to the development of youth and community studies within the college. (10971)

Further details and application forms may be obtained from the Principal, Avery Hill College, Bexley Road, Ripham, SE29 2PQ. Tel: 01-850 0081. (10971)

Closing date for applications is 18th October 1984. (10971)

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Colleges and Institutes of Higher Education

SOUTH GLAMORGAN COUNTY COUNCIL

SOUTH GLAMORGAN INSTITUTE OF HIGHER EDUCATION (CARDIFF)

DEPARTMENT OF EDUCATION

SENIOR LECTURER/DIRECTOR OF LANGUAGE AND READING CENTRE

POST NO. LR6 (RE-ADVERTISEMENT)

Applications are invited from highly qualified graduates, preferably with a higher degree, and well versed in recent research and current issues in Language and Reading. Applicants for this challenging post should have successful teaching experience, preferably in primary schools. The vacancy arises following the appointment of the present Director to Her Majesty's Inspectorate. Responsibilities will include a teaching commitment to B.Ed., P.G.C.E., and In-Service Diploma Courses, as well as the University of Wales, and direction of the administration and organisation of the thriving and well-resourced Centre. Duties to commence as soon as possible.

SALARY SCALE: £11,175-£14,061.

LECTURER 2/SENIOR LECTURER IN ENGLISH AND PROFESSIONAL STUDIES

POST NO. PU47 (RE-ADVERTISEMENT)

Applications are invited from well-qualified graduates in English or in an English language specialist with recent substantial teaching experience, preferably in the primary sector, to commence duties as soon as possible. The successful candidate will be expected to contribute to courses in initial and in-service training of teachers and, in particular, in the field of children's literature and creativity in language.

SALARY SCALE: Lecturer 2/Senior Lecturer level £7,548-£14,061, subject to the 12 scale dependent on qualifications and experience.

Further particulars and application forms may be obtained from The Personnel Officer, South Glamorgan Institute of Higher Education, Cyncoed Centre, Cyncoed Road, Cardiff CF2 6XD. (Telephone: Cardiff 755755, Ext. 295). Completed application forms should be returned within fourteen days of the publication of this advertisement. (10937)

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PRINCIPAL LECTURER IN OPERATIONS MANAGEMENT/BUSINESS INFORMATION SYSTEMS

(Re-advertisement)

Salary £12,519-£15,744

Applications are invited for the above post in the Department of Business and Management Studies. The person appointed will have good industrial experience in the field of operations management and sound knowledge of the range of micro-computing systems and applications in business. High academic and/or professional qualifications will be required. Previous applicants will be considered.

Further details and application forms may be obtained from the Deputy Registrar, to whom completed applications should be returned by 17th October 1984. (10953)

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Colleges of Further Education

City of Salford
SALFORD COLLEGE OF TECHNOLOGY
Department of Construction & Surveying

PRINCIPAL LECTURER

HEAD OF PROFESSIONAL AND TECHNICAL STUDIES

Applicants are invited for the above post with duties to commence from 1 January 1985.

The successful candidate will provide managerial and academic leadership within a Unit offering courses in the fields of Construction, Housing and Surveying Studies. Candidates should have academic and/or professional qualifications in one of these fields and experience in course development.

Salary will be in accordance with the Burnham FE scales for Teachers in Establishments of Further Education viz: Principal Lecturer: £13,096-£16,467 per annum (under review) with starting salary dependent upon experience.

Further details and application forms may be obtained from the Principal, Salford College of Technology, Frederick Road, Salford M6 6PU. Tel: 061 738 8841, to whom completed forms should be returned without delay. (10957)

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Your
direct line
to recruitment
advertising for
Higher Education.

Contact: Bernadette Alexander.

INFORMATION TECHNOLOGY (ii)
An 8 page report including articles on Artificial Intelligence, the imaginative use of videodiscs, remote sensing, the Alway programme, control engineering. First published in the THES in June 1984. Price 80p

MANAGEMENT EDUCATION
An 8 page report discussing the state of management education. Also includes 2 pages of management book reviews. First published in THES in April 1984. Price 80p.

Please make cheques payable to Times Newspapers Ltd and send with your order to:
Linda Bartlett, The Times Supplement's, Priory House, St John's Lane, London EX1M 4BX.

Please make cheques payable to Times Newspapers Ltd and send with your order to:
Linda Bartlett, The Times Supplement's, Priory House, St John's Lane, London EX1M 4BX.